MOTOR AGE

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No. 23

CHICAGO, DECEMBER 7, 1916

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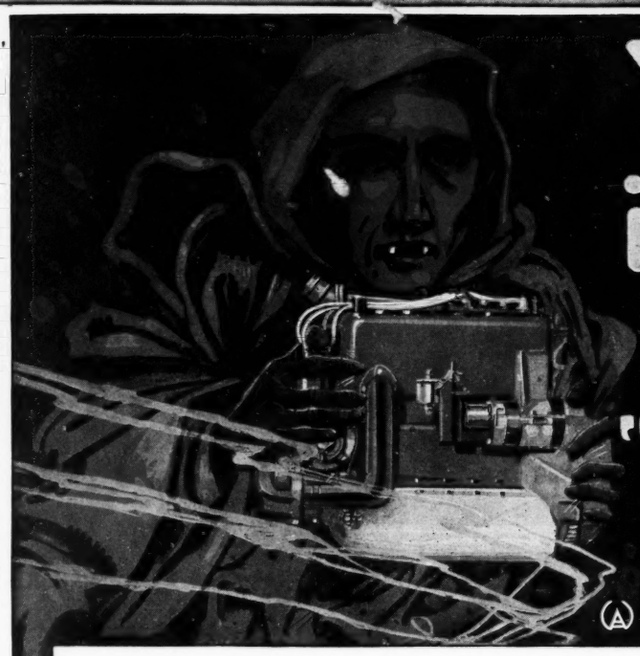

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Address.....

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MOTOR AGE

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ANNOUNCEMENTS

Carbureters and Carburetion, which will be the feature of the next issue of Motor Age, will give clear and concise information on what manufacturers of these instruments are doing toward handling lower grades of fuel and meeting demand for greater economy and better acceleration. Also, owners' care and adjustment of the new carbureters.

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MOTOR AGE

1916 Racing Review

Resta Takes Stellar Honors in Championship Standing with Aitken Second, Rickenbacher Third and De Palma Fourth—Peugeot Champion Car

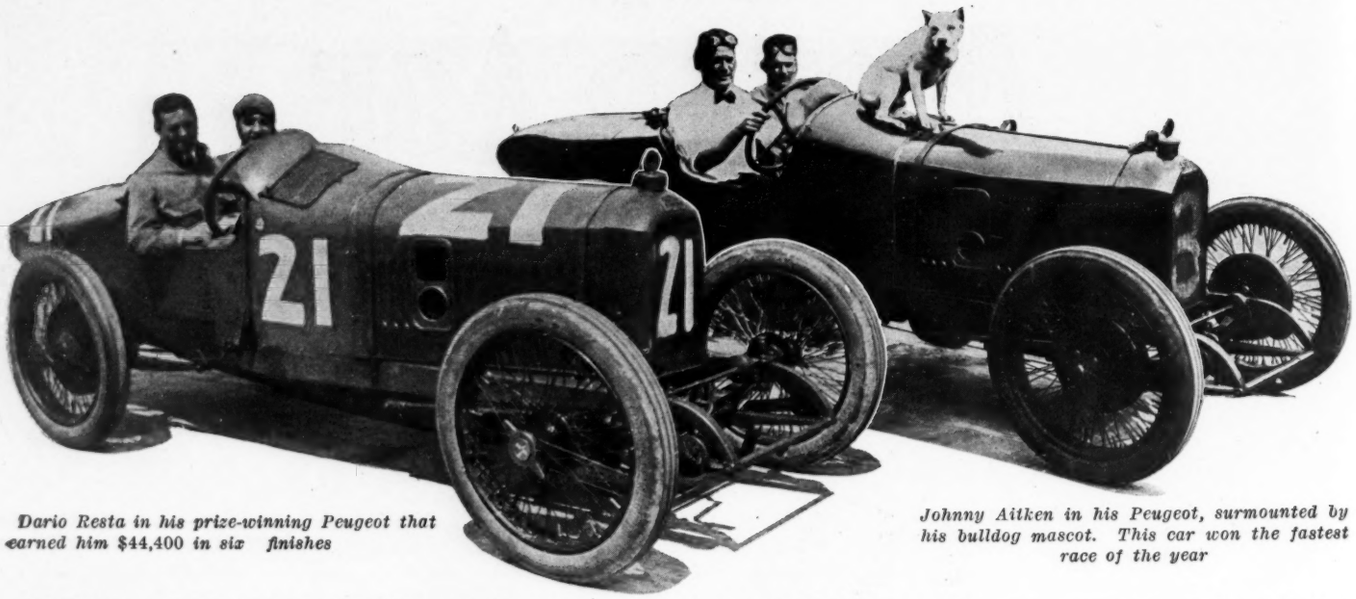
By William K. Gibbs

MASTER of ceremonies, let the gala coronation of the 1916 racing champion begin! The king has just completed the counting of the season's winnings. Now comes the bearer of the royal crown and in his wake two representatives of an industry that made possible the king's right to the season's honors, bearing their contributions to the monarch.

Dario Resta, Italio-Briton, reigns supreme in racing for 1916. This sixty-seven-dollars-and-eight-cents-a-minute wage earner drove the French Peugeot, that has been adjectively described as blue and invincible, to victory in six events in eleven starts and in 1,294 miles of driving garnered $44,400 in prize money, 4,100 points in the American Automobile Association championship award, $5,000 of the Goodrich and $2,000 of the Bosch prize money and $1,000 silver trophy of the latter for the season's champion and went through the season with the distinction of winning every race that he finished.

By winning fourteen firsts the Peugeot wrests from America the laurels that went to Stutz last year and thus we must pay homage to a car and driver both from foreign shores.

The making of titular awards at the end



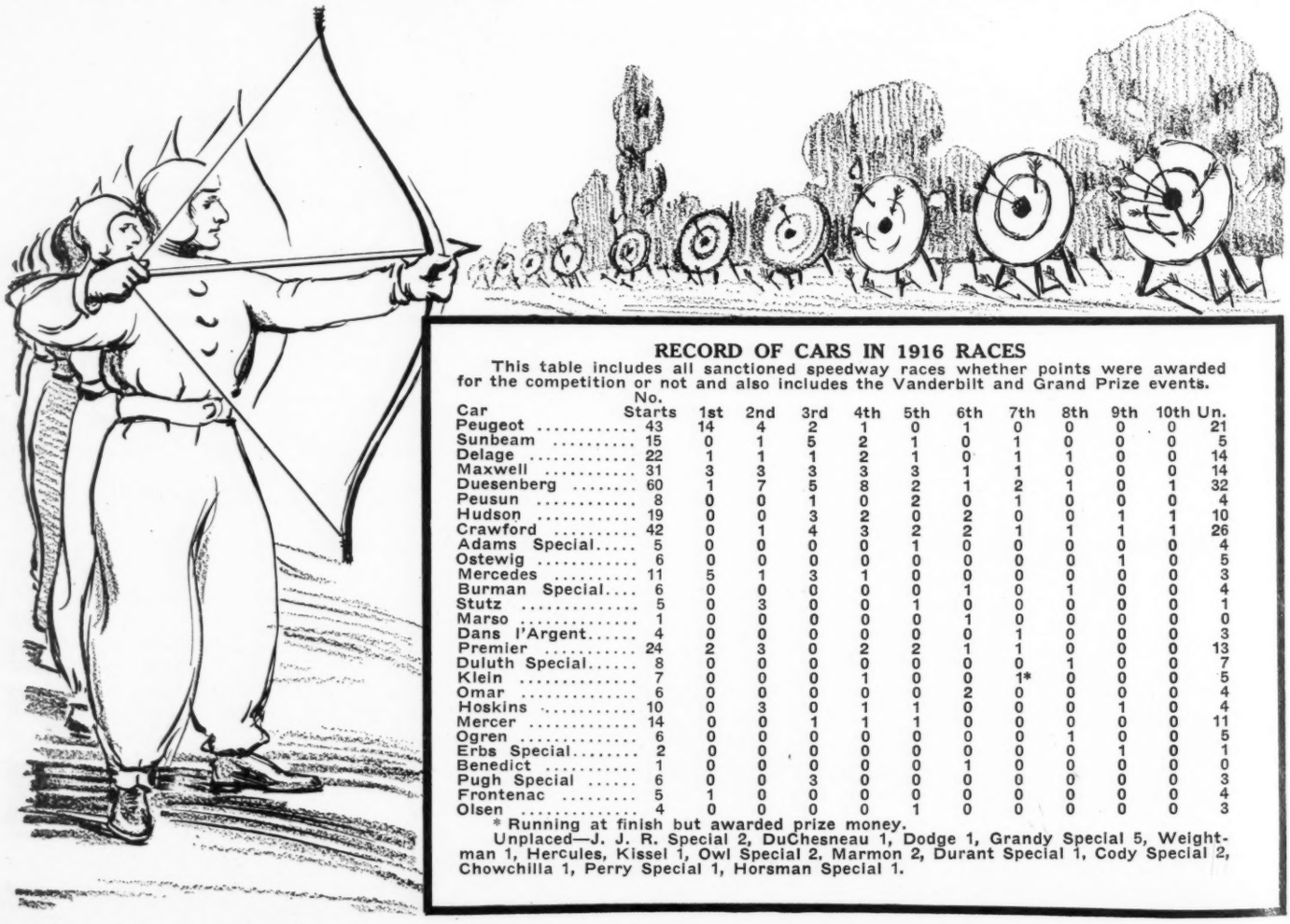
Dario Resta in his prize-winning Peugeot that earned him $44,400 in six finishes

Johnny Aitken in his Peugeot, surmounted by his bulldog mascot. This car won the fastest race of the year

of each racing season is a practice Motor Age has made for several years and the precedent it set is the germ that brought decision to the American Automobile Association to award a certain graduated number of points for finishers in races this year. By this adoption of the point system, picking the champion is not fraught with the many vicissitudes that have marked the choice in previous years and this is just one more angle in favor of standardization—the goal so many industries are bending their efforts to bring to materialization.

All the interest that in the good old days of melodrama was displayed when hero or villain triumphed, all the spirited enthusiasm that marks the nose-to-nose dash of thoroughbreds to the wire, the tensity of nerves that make one's blood tingle when the bases are full and two are out in a ninth inning tie in the world's series were crystalized in the mad dash after the $244,083.33 in purses hung up for 27 speed events for the 1916 season, and in addition the lion's share of $13,500 additional money and cup offered by the Goodrich and Bosch companies that carried with it the title of "Champion Driver of America."

The big four of this year's racing events are Resta, Aitken, Rickenbacher and de



RECORD OF CARS IN 1916 RACES

This table includes all sanctioned speedway races whether points were awarded for the competition or not and also includes the Vanderbilt and Grand Prize events.

Car	No. Starts	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Un.
Peugeot	43	14	4	2	1	0	1	0	0	0	0	21
Sunbeam	15	0	1	5	2	1	0	1	0	0	0	5
Delage	22	1	1	1	2	1	0	1	1	0	0	14
Maxwell	31	3	3	3	3	3	1	1	0	0	0	14
Duesenberg	60	1	7	5	8	2	1	2	1	0	1	32
Peusun	8	0	0	1	0	2	0	1	0	0	0	4
Hudson	19	0	0	3	2	0	2	0	0	1	1	10
Crawford	42	0	1	4	3	2	2	1	1	1	1	26
Adams Special	5	0	0	0	0	1	0	0	0	0	0	4
Ostewig	6	0	0	0	0	0	0	0	0	1	0	5
Mercedes	11	5	1	3	1	0	0	0	0	0	0	3
Burman Special	6	0	0	0	0	0	1	0	1	0	0	4
Stutz	5	0	3	0	0	1	0	0	0	0	0	1
Marso	1	0	0	0	0	0	1	0	0	0	0	0
Dans l'Argent	4	0	0	0	0	0	0	1	0	0	0	3
Premier	24	2	3	0	2	2	1	1	0	0	0	13
Duluth Special	8	0	0	0	0	0	0	0	1	0	0	7
Klein	7	0	0	0	1	0	0	1*	0	0	0	5
Omar	6	0	0	0	0	0	2	0	0	0	0	4
Hoskins	10	0	3	0	1	1	0	0	0	1	0	4
Mercer	14	0	0	1	1	1	0	0	0	0	0	11
Ogren	6	0	0	0	0	0	0	0	1	0	0	5
Erbs Special	2	0	0	0	0	0	0	0	0	1	0	1
Benedict	1	0	0	0	0	0	1	0	0	0	0	0
Pugh Special	6	0	0	3	0	0	0	0	0	0	0	3
Frontenac	5	1	0	0	0	0	0	0	0	0	0	4
Olsen	4	0	0	0	0	1	0	0	0	0	0	3

* Running at finish but awarded prize money.

Unplaced—J. R. Special 2, DuChesneau 1, Dodge 1, Grandy Special 5, Weightman 1, Hercules, Kissel 1, Owl Special 2, Marmon 2, Durant Special 1, Cody Special 2, Chowchilla 1, Perry Special 1, Horsman Special 1.

Palma. All through the year this quartet furnished much of the competition that makes racing of such compelling interest. Many times it was doubtful who would wear the 1916 crown as champion.

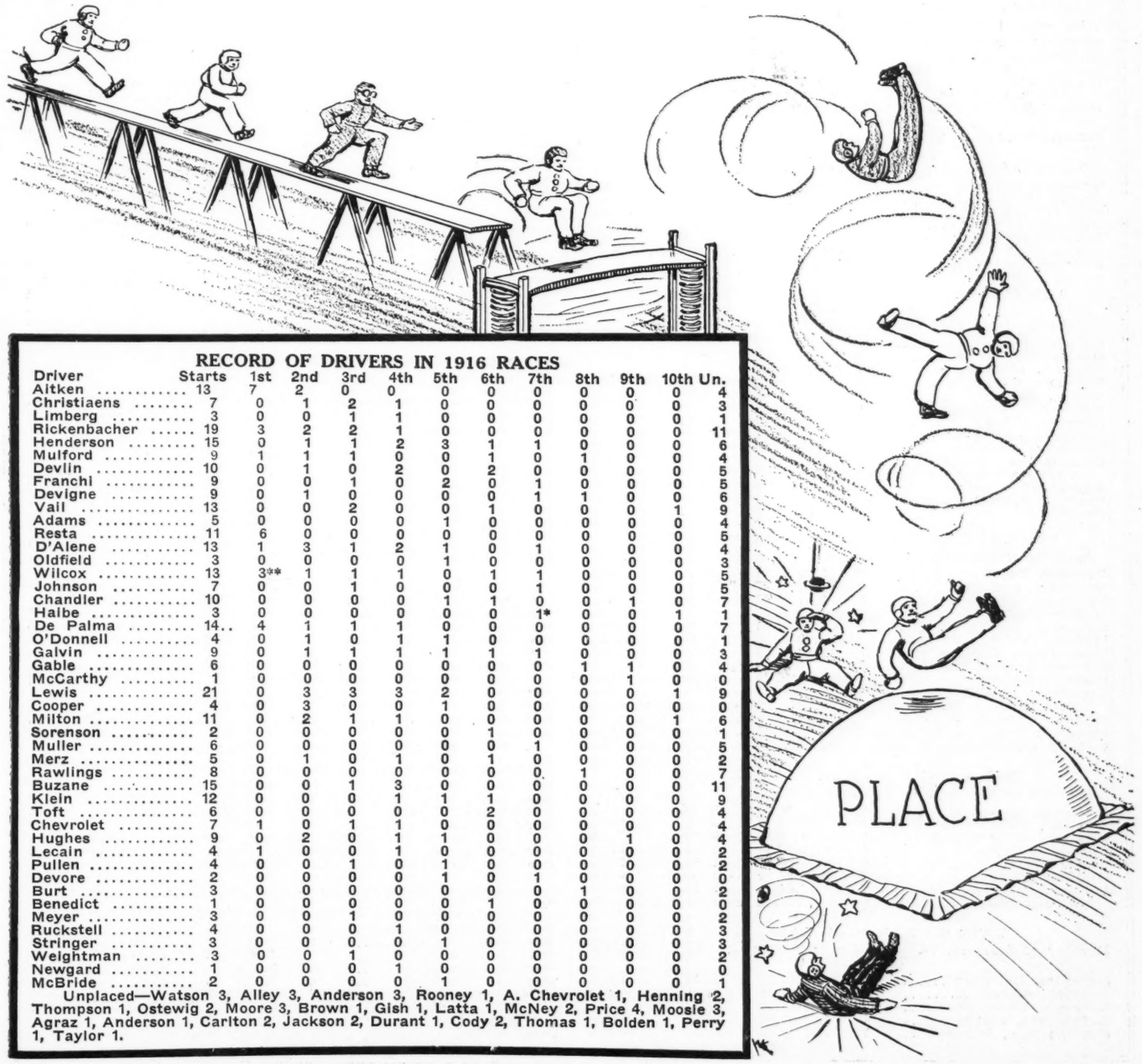
To Eddie Rickenbacher goes the honors of having been the first to win points at the opening and to Baron Rick goes the distinction of having taken first in the last race of the year that carried points.

Jockeying to head the league standing, if one may be permitted the liberty of dropping into baseball parlance when speaking of motor car racing was evident throughout the year. Rickenbacher by taking the Metropolitan trophy race at New York in May moved to the head of the class, only to be displaced a fortnight later at Indianapolis by Resta, who won the Hoosier classic which this year was little more than a procession. Difference in distance between the New York and Indianapolis races made a difference in points which favored the doughty Dario. Repeating at Chicago—and here seems an apropos point to mention that in every professional race run on the Chicago oval he has carried away the blue ribbon—Resta secured what appeared to be a safe lead over the others in points. Just to make it more secure he nosed Ralph Mulford, also in a Peugeot, out at Omaha and was 710 points ahead of his nearest rival, Ralph de Palma.

Now enters the dark horse, namely, Johnny Aitken, who up to this time had a score of 320 points against Resta's 2,400. Aitken piloted his Peugeot to victory in three straight races, Cincinnati, Indianapolis and the Astor Cup at New York, which carried enough points to put him in the lead with 120 to spare. Resta's supremacy on the Chicago course stood him in good stead and in the Sweepstakes event in October he humbled Aitken into second place and jumped into the lead in points again, only to forfeit it to Aitken in the Harkness trophy race at New York a few days later.

Then came the crucial moment, the climax, if you please. The scene changes to sunny California and followers of racing looked for a decision of the supremacy of Resta and Aitken to come in these two events, which were not essentially speedway races, but more nearly speedway meets, perhaps, than road races. The Santa Monica boulevard course over which the Vanderbilt and Grand Prize races were run makes possible fast driving and the American Automobile Association fixed the points for the former at 900 and the latter at 1,000.

Resta took the Vanderbilt and put his total of points up to 4,100, and 2 days later Aitken's Peugeot ran into difficulties



RECORD OF DRIVERS IN 1916 RACES

Driver	Starts	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Un.
Aitken	13	7	2	0	0	0	0	0	0	0	0	4
Christiaens	7	0	1	2	1	0	0	0	0	0	0	3
Limberg	3	0	0	1	1	0	0	0	0	0	0	1
Rickenbacher	19	3	2	2	1	0	0	0	0	0	0	11
Henderson	15	0	1	1	2	3	1	1	0	0	0	6
Mulford	9	1	1	1	0	0	1	0	1	0	0	4
Devlin	10	0	1	0	2	0	2	0	0	0	0	5
Franchi	9	0	0	1	0	2	0	1	0	0	0	5
Devigne	9	0	1	0	0	0	0	1	1	0	0	6
Vail	13	0	0	2	0	0	1	0	0	0	1	9
Adams	5	0	0	0	0	1	0	0	0	0	0	4
Resta	11	6	0	0	0	0	0	0	0	0	0	5
D'Alene	13	1	3	1	2	1	0	1	0	0	0	4
Oldfield	3	0	0	0	0	1	0	1	0	0	0	3
Wilcox	13	3**	1	1	1	0	1	1	0	0	0	5
Johnson	7	0	0	1	0	0	1	1	0	0	0	5
Chandler	10	0	0	0	0	1	0	0	0	1	0	7
Halbe	3	0	0	0	0	0	0	1*	0	0	1	1
De Palma	14..	4	1	1	1	0	0	0	0	0	0	7
O'Donnell	4	0	1	0	1	1	0	0	0	0	0	1
Galvin	9	0	1	1	1	1	1	1	0	1	0	3
Gable	6	0	0	0	0	0	0	0	1	1	0	4
McCarthy	1	0	0	0	0	0	0	0	0	1	0	0
Lewis	21	0	3	3	3	2	0	0	0	0	1	9
Cooper	4	0	3	0	0	1	0	0	0	0	0	0
Milton	11	0	2	1	1	0	1	0	0	0	1	6
Sorenson	2	0	0	0	0	0	1	0	0	0	0	1
Muller	6	0	0	0	0	0	0	1	0	0	0	5
Merz	5	0	1	0	1	0	0	1	0	0	0	2
Rawlings	8	0	0	0	3	0	0	0	1	0	0	7
Buzane	15	0	0	1	3	0	0	0	0	0	0	11
Klein	12	0	0	0	1	1	1	0	0	0	0	9
Toft	6	0	0	0	0	0	2	0	0	0	0	4
Chevrolet	7	1	0	1	1	0	0	0	0	0	0	4
Hughes	9	0	2	0	1	1	0	0	0	1	0	4
Lecain	4	1	0	0	1	0	0	0	0	0	0	2
Pullen	4	0	0	1	0	1	0	0	0	0	0	2
Devore	2	0	0	0	0	0	0	1	0	0	0	1
Burt	3	0	0	0	0	0	1	0	1	0	0	2
Benedict	1	0	0	0	0	0	0	0	0	0	0	0
Meyer	3	0	0	1	0	0	0	0	0	0	0	2
Ruckstell	4	0	0	0	1	0	0	0	0	0	0	3
Stringer	3	0	0	0	0	1	0	0	0	0	0	3
Weightman	3	0	0	1	0	0	0	0	0	0	0	2
Newgard	1	0	0	0	1	0	0	0	0	0	0	0
McBride	2	0	0	0	0	1	0	0	0	0	0	1

Unplaced—Watson 3, Alley 3, Anderson 3, Rooney 1, A. Chevrolet 1, Henning 2, Thompson 1, Ostewig 2, Moore 3, Brown 1, Gish 1, Latta 1, McNey 2, Price 4, Moosle 3, Agraz 1, Anderson 1, Carlton 2, Jackson 2, Durant 1, Cody 2, Thomas 1, Bolden 1, Perry 1, Taylor 1.

and went out in the first lap. With an eye on the 1,000 points in the Grand Prize, Aitken relieved his teammate, Wilcox, and as Resta dropped out, Aitken put the mount that Wilcox started across the line, a winner. For the moment it looked as if he would get a prorata of points, or for driving twenty-four laps he would get 584 points. However, since the A. A. A. ruled that Rickerbacher was not entitled to any of the points won at Indianapolis Decoration day when he relieved Henderson and placed his teammate's Maxwell, the precedent apparently robbed Aitken of points or money in the Grand Prize and thus, while Resta did not add to his 4,100, Aitken's 3,440 points remained unchanged.

Interest next centered at Ascot where the last point race of the season was run on Thanksgiving day. Here the winner was awarded 700 points, enough for Aitken to nose Resta out, if the latter did not place, and conjurers juggled the "ifs" and "ands" and pointed out that if Aitken won, Resta probably would not place as he has a record of not placing in any race this year that he did not win.

The Ascot race saw neither Resta or Aitken as entrants and Aitken waived the championship to Resta, which made defense of his title unnecessary for Dario. In general the foregoing shows how the leaders fought for place and the big end

RACE RECORDS OF THE 1916 SEASON

CONEY ISLAND CUP RACE, 20 MILES, NEW YORK, MAY 13

Number of Starters, 13. Number to Finish, 5. Purse, $1,500

Car and Driver	Order of Fin.	Time	M.P.H.	Purse
Peugeot, Aitken	1	11:15.81	106.71	$ 600.00
Sunbeam, Christiaens	2	11:26.52	104.54	350.00
Delage, Limberg	3	11:27.53	104.32	250.00
Maxwell, Rickenbacher	4	11:27.63	104.32	200.00
Maxwell, Henderson	5	11:54.91	100.35	100.00

Also started—Peugeot, Mulford; Crawford, Chandler; Delage, Devigne; Peusun, Franchi; Crawford, Lewis; Hudson, Vail; Adams Special, Adams; Duesenberg, Devlin.

QUEEN'S CUP RACE, 50 MILES, NEW YORK, MAY 13

Number of Starters, 9. Number to Finish, 4. Purse, $2,300

Peugeot, Mulford	1	28:45.04	104.34	1,000.00
Duesenberg, Devlin	2	30:15.98	99.11	600.00
Peusun, Franchi	3	30:16.26	99.09	400.00
Delage, Limberg	4	31:35.30	98.94	300.00

Also started—Maxwell, Rickenbacher; Maxwell, Henderson; Peugeot, Aitken; Hudson, Vail; Delage, Devigne.

METROPOLITAN TROPHY RACE, 150 MILES, NEW YORK, MAY 13

Number of Starters, 10. Number to Finish, 4. Purse, $14,000

Maxwell, Rickenbacher	1	1:33:31	96.53	6,000.00
Delage, Devigne	2	1:35:11	94.56	3,500.00
Hudson, Vail	3	1:38:44	90.15	2,000.00
Duesenberg, Devlin	4	1:43:03	87.34	1,500.00
Adams Special, Adams	5	1:51:00	81.08	1,000.00

Also started—J. J. R. Spc., Watson; Peugeot, Resta; Peusun, Franchi; Delage, Limberg; Peugeot, Mulford.

INDIANAPOLIS INTERNATIONAL SWEEPSTAKES, 300 MILES, MAY 30

Number of Starters, 21. Number to Finish, 10. Purse, $30,000

Peugeot, Resta	1	3:34:15.71	84.05	12,000.00
Duesenberg, D'Alene	2	3:36:15.28	83.25	6,000.00
Peugeot, Mulford	3	3:37:56.20	82.65	3,000.00
Sunbeam, Christiaens	4	3:46:36.03	79.45	2,000.00
Delage, Oldfield	5	3:47:19.63	79.20	1,700.00
Maxwell, Henderson	6	3:49:56.48	78.35	1,400.00
Premier, Wilcox	7	3:54:31.31	76.85	1,200.00
Crawford, Johnson	8	4:01:54.75	74.45	1,000.00
Crawford, Chandler	9	4:03:10.51	74.05	900.00
Ostewig Spc., Haibe	10	4:04:47.10	73.30	800.00

Also started—Ogren, Alley; Frontenac, L. Chevrolet; Premier, Anderson; Crawford, Lewis; Peugeot, Aitken; Delage, Devigne; Premier, Rooney; Peugeot, Merz; Maxwell, Rickenbacher; Peusun, Franchi.

CHICAGO MOTOR DERBY, 300 MILES, JUNE 11

Number of Starters, 21. Number to Finish, 10. Purse, $30,000

Peugeot, Resta	1	3:02:31.64	98.61	13,000.00
Mercedes, DePalma	2	3:04:25.37	97.60	6,500.00
Sunbeam, Christiaens	3	3:07:55.48	95.78	3,000.00
Duesenberg, O'Donnell	4	3:08:30.46	95.48	1,500.00
Sunbeam, Galvin	5	3:10:23.45	94.54	1,300.00
Hudson, Vail	6	3:10:30.65	94.48	1,200.00
Duesenberg, D'Alene	7	3:13:02.85	93.24	1,100.00
Burman Special, Gable	8	3:15:51.31	91.90	900.00
Hudson, McCarty	9	3:19:10.73	90.38	800.00
Crawford, Lewis	10	3:24:58.07	88.63	700.00

Also started—Duesenberg, Buzane; Peugeot, Rickenbacher; Delage, Oldfield; Klein Special, Alley; Klein Special, Klein; Ogren, Henning; Crawford, Johnson; Ostewig Special, Haibe; Olsen Special, Thompson; J. J. R. Spc., Watson; Duluth Special, Rawlings.

DES MOINES 150-MILE RACE, JUNE 24

Number of Starters, 9. Number to Finish, 7. Purse, $8,000

Mercedes, DePalma	1	1:36:36.23	92.66	3,000.00
Maxwell, Henderson	2	1:38:13.72	91.20	1,500.00
Maxwell, Rickenbacher	3	1:39:18.72	90.40	750.00
Crawford, Lewis	4	1:40:00.01	90.00	600.00
Stutz, Cooper	5	1:40:08.96	89.90	500.00
Hudson, Mulford	6	1:45:27.15	86.30	450.00
Sunbeam, Galvin	7	1:46:44.40	85.50	400.00

Also started—Crawford, Chandler, and Duesenberg, O'Donnell.

TWIN CITY 150-MILE RACE, JULY 4

Number of Starters, 14. Number to Finish, 7. Purse, $6,844.88 (Adv., $15,000)

Mercedes, DePalma	1	1:38:49.20	91.08	2,754.00
Peugeot, Aitken	2	1:40:14.05	89.70	1,606.00
Sunbeam, Christiaens	3	1:43:28.75	87.00	918.13
Duesenberg, Milton	4	1:44:11.95	86.50	688.60
Hoskins Spc., O'Donnell	5	1:47:37.95	83.60	459.07
Marso, Sorenson	6	1:56:14.45	77.60	275.45
Dans L'Argent, Muller	7	2:01:18.20	74.70	143.63

Also started—Duesenberg, Buzane; Premier, Anderson; Maxwell, Rickenbacher; Maxwell, Henderson; Frontenac, L. Chevrolet; Sunbeam, Galvin; Ostewig Special, Ostewig.

SIOUX CITY 10-MILE RACE, JULY 8

Number of Starters, 10. Number to Finish, 6. Purse, $327

Duesenberg, D'Alene	1	7:31.96	79.60	130.80
Peugeot, Merz	2	7:41.34	78.03	81.75
Crawford, Lewis	3	8:00.90	74.85	49.05
Premier, Wilcox	4	8:10.80	73.35	32.70
Peusun, Franchi	5	8:16.05	72.56	22.89
Burman Spc., Gable	6	8:17.38	72.38	9.81

Also started—Crawford, Johnson; Delage, Devigne; Crawford, Chandler; Duluth Special, Rawlings.

SIOUX CITY 20-MILE RACE, JULY 8

Number of Starters, 12. Number to Finish, 8. Purse, $492.50

Premier, Wilcox	1	15:18.78	78.40	196.20
Duesenberg, D'Alene	2	15:59.43	75.04	98.10
Crawford, Lewis	3	16:00.36	74.97	73.57
Peugeot, Merz	4	16:18.43	73.58	49.05
Peusun, Franchi	5	16:25.25	73.09	29.43
Crawford, Chandler	6	16:42.41	71.82	19.62
Crawford, Johnson	7	16:44.41	71.48	14.71
Delage, Devigne	8	16:50.41	71.25	9.81

Also started—Duluth Special, Rawlings; Klein Special, Klein; Mercer, Stringer, and Burman Special, Gable.

SIOUX CITY 50-MILE RACE, JULY 8

Number of Starters, 15. Number to Finish, 8. Purse, $818.95

Premier, Wilcox	1	40:59.00	72.57	408.75
Crawford, Lewis	2	41:31.31	72.26	163.50
Crawford, Johnson	3	41:35.25	72.06	81.75
Duesenberg, D'Alene	4	42:45.37	70.17	65.40
Crawford, Chandler	5	42:46.35	70.12	49.05
Peugeot, Merz	6	43:02.86	69.70	24.52
Peusun, Franchi	7	43:35.73	68.82	16.35
Duluth Spc., Rawlings	8	45:09.02	66.44	8.17

Also started—Hudson, Vail; Delage, Moore; Burman Special, Gable; Delage, Devigne; Klein Special, Klein; Duesenberg, Devlin; Mercer, Stringer.

OMAHA 50-MILE RACE, JULY 15

Number of Starters, 8. Number to Finish, 4. Purse, $2,500

Mercedes, DePalma	1	29:02.47	103.45	1,200.00
Maxwell, Rickenbacher	2	30:01.65	99.89	600.00
Maxwell, Henderson	3	30:07.16	99.61	400.00
Crawford, Lewis	4	31:37.10	94.89	300.00

Also started—Mercer, Stringer; Duesenberg, Milton; Hudson, Mulford; Duluth Special, Rawlings.

OMAHA 150-MILE RACE, JULY 15

Number of Starters, 17. Number to Finish, 5. Purse, $5,500

Peugeot, Resta	1	1:30:43.88	99.02	3,000.00
Peugeot, Mulford	2	1:31:56.24	98.39	1,500.00
Duesenberg, Milton	3	1:32:32.25	97.30	600.00
Maxwell, Henderson	4	1:40:06.27	90.00	400.00
Mercer, Stringer	5	1:40:44.00	88.25	.....

Also started—Maxwell, Rickenbacher; Mercedes, DePalma; Klein Special, Klein; Hudson, Vail; Dans L'Argent, Muller; Burman Special, Gable; Crawford, Johnson; Crawford, Chandler; Delage, Hughes; Peusun, Franchi; Crawford, Lewis; Duesenberg, D'Alene.

KANSAS CITY 100-MILE RACE, JULY 22

Number of Starters, 12. Number to Finish, 4. Purse, $4,500

Mercedes, DePalma	1	1:42:54	58.48	2,500.00
Duesenberg, O'Donnell	2	1:45:06	57.02	1,000.00
Duesenberg, Buzane	3	1:49:42	52.98	600.00
Klein Special, Klein	4	1:52:56	50.29	400.00

Also started—Crawford, Johnson; Maxwell, Rickenbacher; Duesenberg, Devlin; Maxwell, Henderson; Crawford, Chandler; Crawford, Lewis; Ogren, Burt; DuChesneau, Brown.

TACOMA MONTAMARATHON, 300 MILES, AUGUST 5

Number of Starters, 14. Number to Finish, 6. Purse, $10,000

Maxwell, Rickenbacher	1	3:21:40.10	89.30	4,000.00
Duesenberg, Milton	2	3:23:05.62	88.60	2,500.00
Crawford, Lewis	3	3:24:29.35	88.00	1,500.00
Mercedes, DePalma	4	3:27:20.41	87.00	1,000.00
Maxwell, Henderson	5	3:33:03.96	84.50	750.00
Omar Special, Toft	6	3:33:25.62	84.40	250.00

Also started—Duesenberg, D'Alene; Crawford, Johnson; Dodge, Iatta; Crawford, Chandler; Gandy Special, Price; Duesenberg, Sorenson; Delage, Oldfield; Gandy Special, Moosie.

of the prize money and the title, but there were many features that put the interest in an interesting season of racing, in which records were broken and speed attained that prognosticators were chary about predicting a few seasons ago.

Whereas last year but seven drivers attained a speed of better than 100 miles per hour, 1916 saw twenty-one finishers rolling up an average of better than the century. The fastest race of the year was the first one—the Coney Island Cup event—in which Johnny Aitken averaged 106.71 miles an hour for 20 miles. The second fastest race as well as the third were taken by Aitken on the New York course, the Harkness trophy dash of 100 miles being won at 105.95 m. p. h. and the Astor cup average for 250 miles was 104.83 m. p. h. This gives Aitken three races won at over 100 m. p. h., and the next fastest was the 50-mile Queen's Cup at New York, taken by Ralph Mulford at 104.34 m. p. h. Resta took the Grand American race at Chicago and the Chicago Grand Prix at 103.99 and 100.42 respectively, while de Palma took the honors in the only other race won at better than 100 m. p. h., when he finished the 50-mile event at Omaha at an average speed of 103.45. The other fourteen that finished at better than 100 m. p. h. in 1916 were not any of them fortunate enough to be first under the wire.

RACE RECORDS OF THE 1916 SEASON

SPEEDWAY GRAND PRIX, 50 MILES, CHICAGO, AUGUST 19

Number of Starters, 8. Number to Finish, 5. Purse, $10,000

Car and Driver	Order of Fin.	Time	M.P.H.	Purse
Peugeot, Resta	1	29:52.49	100.42	5,000.00
Hoskins Special, Lewis	2	29:56.77	100.19	2,500.00
Duesenberg, Buzane	3	30:40.37	97.82	1,250.00
Sunbeam, Galvin	4	31:27.89	95.39	750.00
Duesenberg, D'Alene	5	32:03.41	93.58	500.00

Also started—Duesenberg, Milton; Sunbeam, Christiaens; Mercedes, DePalma.

CINCINNATI DERBY, 300 MILES, SEPTEMBER 4

Number of Starters, 28. Number to Finish, 6. Purse, $27,200 (Adv., $30,000)

Peugeot, Aitken	1	3:05:27.22	97.06	13,000.00
Duesenberg, D'Alene	2	3:09:56.27	95.01	6,000.00
Sunbeam, Galvin	3	3:17:16.86	91.25	3,000.00
Duesenberg, Buzane	4	3:23:19.06	88.53	1,500.00
Crawford, Klein	5	3:34:15.06	84.01	1,400.00
Duesenberg, Devlin	6	3:46:06.54	79.60	1,200.00
Klein Special, Haibe*	7	.....	....	1,100.00

* Flagged at 270 miles.

Also started—Sunbeam, Christiaens; Peugeot, Resta; Peugeot, Merz; Premier, Wilcox; Stutz, Anderson; Omar Special, Toft; Crawford, Chandler; Mercedes, DePalma; Maxwell, Rickenbacher; Maxwell, Henderson; Duluth Special, Rawlings; Delage, Franchi; Delage, Lecain; Dans L'Argent, Muller; Duesenberg, Milton; Hudson, Vail; Hoskins Special, Alley; Premier, Lewis; Peugeot, Mulford; Crawford, Moore; Frontenac, L. Chevrolet.

INDIANAPOLIS 20-MILE RACE, SEPTEMBER 9

Number of Starters, 10. Number to Finish, 4. Purse, $1,000

Peugeot, Aitken	1	12:37.35	95.08	400.00
Premier, Wilcox	2	12:37.68	95.03	300.00
Sunbeam, L. Chevrolet	3	13:12.88	90.82	200.00
Hoskins Special, Hughes.	4	13:36.90	88.04	100.00

Also started—Premier, Lewis; Peugeot, DePalma; Duesenberg, Buzane; Ostewig Special, McNay; Maxwell, Henderson; Crawford, Klein.

INDIANAPOLIS 50-MILE RACE, SEPTEMBER 9

Number of Starters, 9. Number to Finish, 5. Purse, $2,000

Peugeot, Aitken	1	32:40.33	91.83	700.00
Hoskins Special, Hughes.	2	32:40.61	91.81	500.00
Sunbeam, L. Chevrolet	3	32:41.10	91.79	400.00
Duesenberg, D'Alene	4	33:25.85	89.75	300.00
Premier, Lewis	5	34:05.46	87.99	100.00

Also started—Premier, Wilcox; Duesenberg, Buzane; Peugeot, DePalma; Duesenberg, Klein.

INDIANAPOLIS 100-MILE RACE, SEPTEMBER 9

Number of Starters, 12. Number to Finish, 7. Purse, $9,000

Peugeot, Aitken	1	1:07:05	89.44	3,500.00
Hoskins Special, Hughes.	2	1:07:24	89.01	2,000.00
Duesenberg, D'Alene	3	1:07:43	88.60	1,200.00
Duesenberg, Buzane	4	1:08:37	87.44	1,000.00
Premier, Lewis	5	1:09:07	86.81	600.00
Omar Special, Toft	6	1:12:40	82.56	400.00
Maxwell, Henderson	7	1:12:43	82.51	300.00

Also started—Peugeot, DePalma; Maxwell, Rickenbacher; Ostewig Special, McNay; Premier, Wilcox; Duesenberg, Milton.

ASTOR CUP RACE, NEW YORK, 250 MILES, SEPTEMBER 30

Number of Starters, 31. Number to Finish, 10. Purse, $25,000

Peugeot, Aitken	1	2:33:04	104.83	10,000.00
Maxwell, Rickenbacher	2	2:24:19	103.90	5,000.00
Hudson, Vail	3	2:34:01	97.40	2,500.00
Delage, Lecain	4	2:34:42	97.00	1,600.00
Mercer, Pullen	5	2:37:26	95.20	1,300.00
Crawford, Klein	6	2:38:01	94.80	1,200.00
Delage, Devigne	7	2:38:31	94.60	1,000.00
Duesenberg, Mulford	8	2:42:02	92.30	900.00
Hoskins Special, Hughes.	9	2:42:56	92.10	800.00
Duesenberg, Milton	10	2:45:37	90.60	700.00

Also started—Pugh Special, Meyer; Adams Special, Adams; Ogren, Burt; Ogren, Henning; Dans L'Argent, Muller; Maxwell, Henderson; Sunbeam, Christiaens; Sunbeam, L. Chevrolet; Duesenberg, Devlin; Duesenberg, Buzane; Erbes Special, Gable; Mercer, Ruckstell; Crawford, Moore; Crawford, D'Alene; Peugeot, Resta; Peugeot, Wilcox; Premier, Galvin; Premier, Lewis; Olsen Special, Watson; Olsen Special, McBride; West Duluth Special, Rawlings.

GRAND AMERICAN, CHICAGO, 250 MILES, OCTOBER 14

Number of Starters, 19. Number to Finish, 10. Purse, $15,000

Car and Driver	Order of Fin.	Time	M.P.H.	Purse
Peugeot, Resta	1	2:24:16.68	103.99	6,000.00
Peugeot, Aitken	2	2:24:32.61	103.65	3,000.00
Maxwell, Rickenbacher	3	2:25:52.76	102.08	1,500.00
Premier, Lewis	4	2:32:28.93	98.37	1,000.00
Maxwell, Henderson	5	2:32:31.39	98.34	900.00
Premier, Galvin	6	2:33:20.50	97.81	800.00
Duesenberg, Devore	7	2:45:35.43	90.58	600.00
Ogren, Burt	8	2:52:05.35	86.66	500.00
Erbes Special, Gable	9	3:04:52.23	81.13	400.00
Hudson, Vail	10	3:05:37.37	80.81	300.00

Also started—Duluth Special, Rawlings; Duesenberg, Buzane; Peugeot, Wilcox; Peugeot, DePalma; Ostewig Special, Ostewig; Crawford, Klein; Crawford, D'Alene; Duesenberg, Milton; Hoskins Special, Hughes.

HARKNESS TROPHY RACE, 100 MILES, NEW YORK

Number of Starters, 21. Number to Finish, 6. Purse, $12,800

Peugeot, Aitken	1	56:37.65	105.95	5,400.00
Premier, Galvin	2	56:45.35	105.71	2,500.00
Peugeot, Wilcox	3	57:10.53	104.90	1,500.00
Maxwell, Henderson	4	59:04.70	101.31	1,000.00
Duesenberg, Devore	5	59:05.47	101.30	600.00
Benedict Spc., Benedict	6	59:23.88	100.90	400.00

Also started—Peugeot, Resta ($1,400 in lap prizes); Hoskins Special, Hughes; Maxwell, Rickenbacher; Hudson, Vail; Premier, Lewis; Crawford, Klein; Crawford, Muller; Duesenberg, Devlin; Duesenberg, Buzane; Duesenberg, Milton; Delage, Lecain; Delage, Devigne; Adams Special, Adams; Weightman Special, Gish; Pugh Special, Meyer.

FIFTY-MILE CONSOLATION RACE, NEW YORK

Number of Starters, 11. Number of Finishers, 5. Purse, $2,500

Delage, Lecain	1	28:49.59	104.20	1,000.00
Duesenberg, Milton	2	30:15.80	99.25	600.00
Pugh Special, Meyer	3	30:16.36	99.10	400.00
Duesenberg, Devlin	4	30:17.11	99.00	300.00
Hoskins Special, Hughes.	5	30:31.40	98.25	200.00

Also started—Crawford, Muller; Crawford, Klein; Duesenberg, Buzane; Adams Special, Adams; Hudson, Vail; Premier, Lewis.

VANDERBILT CUP RACE, 294 MILES, SANTA MONICA, CAL. November 16

Number of Starters, 17. Number to Finish, 4. Purse, $7,500

Peugeot, Resta	1	3:22:48	86.98	4,000.00
Stutz, Cooper	2	3:30:40	83.74	3,000.00
Duesenberg, Weightman	3	3:42:00	79.46	1,000.00
Hudson, Roods	4	3:54:45	75.20	500.00

Also started—Gandy Special, Price; Cody Special, Cody; Duesenberg, Rickenbacher; Owl, Carlton; Mercer, Ruckstell; Omar, Toft; Marmon, Jackson; Duesenberg, Moosie; Mercer, Thomas; Peugeot, Aitken; Mercer, Pullen; Chowchilla, Bolden.

GRAND PRIZE RACE, 403 MILES, SANTA MONICA, CAL., November 18

Number of Starters, 20. Number to Finish, 4. Purse, $7,500

Peugeot, Aitken-Wilcox	1	4:42:47	85.59	4,000.00
Stutz, Cooper	2	4:48:55	83.74	2,000.00
Hudson, Patterson	3	5:09:38	78.13	1,000.00
Hudson, Roads	4	5:34:59	72.27	500.00

Also started—Peugeot, Aitken; Hercules, Agraz; Kissel, Anderson; Duesenberg, Moosie; Owl Special, Carlton; Mercer, Pullen; Hudson, Vail; Omar, Toft; Gandy, Price; Marmon, Jackson; Durant Special, Durant; Cody Special, Cody; Peugeot, Resta; Duesenberg, Rickenbacher; Duesenberg, Buzane; Mercer, Ruckstell.

ASCOT DERBY, 150 MILESS, LOS ANGELESS, CAL., November 30

Number of Starters, 12. Number to Finish, 4. Purse, $5,000

Duesenberg, Rickenbacher	1	2:13:15	67.54	3,000.00
Stutz, Cooper	2	2:14:29	66.92	1,250.00
Mercer, Pullen	3	2:15:30	66.65	500.00
Mercer, Ruckstell	4	Flagged		250.00

Also started—Duesenberg, Moosie; Hudson, Vail; Omar, Toft; Gandy Special, Price; Duesenberg, Buzane; Duesenberg, Weightman; Perry Special, Perry; Horsman Special, Taylor.

UNIVERSAL TROPHY RACE, 112 MILES, UNIONTOWN, PA.

Number of Starters, 7. Number to Finish, 5. Purse, $2,700

Frontenac, Chevrolet	1	1:14:12.40	90.69	1,000.00
Premier, Lewis	2	1:16:36.20	87.74	700.00
Mercedes, DePalma	3	1:17:56.40	86.33	500.00
Crawford, Newfard	4	1:25:00.00	79.12	300.00
Olsen, McBride	5	1:25:00.00	79.12	200.00

Also started—Hoskins, Hughes; Premier, Galvin.

SUMMARY OF SIX YEARS OF SPEEDWAY RACING

Year	Race	Dist.	Starters	Finishers	Winning Car and Driver	M.P.H.
1911	Indianapolis	500	38	12	Marmon, Harroun.....	74.59
1912	Indianapolis	500	22	10	National, Dawson.....	78.70
1913	Indianapolis	500	27	10	Peugeot, Gouz.....	76.92
1914	Sioux City.....	300	17	9	Duesenberg, Rickenbacher...	78.60
1914	Tacoma Monta-marathon	250	14	5	Stutz, Earl Cooper.....	73.44
1914	Tacoma Potlatch	200	14	6	Maxwell, Hughes.....	74.28
1914	Tacoma Intercity	100	11	6	Frantz, Parsons.....	73.60
1915	Indianapolis	500	24	11	Mercedes, De Palma.....	89.84
1915	Chicago	500	21	12	Peugeot, Resta.....	97.58
1915	Sioux City.....	300	15	6	Maxwell, Rickenbacher.....	74.70
1915	Omaha	302	8	4	Maxwell, Rickenbacher.....	91.74
1915	Tacoma Monta-marathon	250	13	5	Mercer, Ruckstell.....	84.80
1915	Tacoma Potlatch	200	8	4	Mercer, Pullen.....	85.00
1915	Tacoma Intercity	100	10	5	Parsons Special, Parsons.....	79.50
1915	Des Moines.....	300	11	8	Duesenberg, Mulford.....	87.00
1915	Twin City.....	500	14	6	Stutz, Earl Cooper.....	86.35
1915	Providence	100	14	8	Maxwell, Rickenbacher.....	67.11
1915	New York.....	350	20	6	Stutz, Anderson.....	102.56
1915	Chicago	100	4	3	Peugeot, Resta.....	101.86
1915	New York.....	100	6	3	Peugeot, Resta.....	105.30
1915	Providence	25	8	4	Peugeot, Burman.....	69.76
1916	New York.....	20	13	5	Peugeot, Aitken.....	106.71
1916	New York.....	50	9	4	Peugeot, Mulford.....	104.34
1916	New York.....	150	10	5	Maxwell, Rickenbacher.....	96.53
1916	Indianapolis	300	21	10	Peugeot, Resta.....	84.05
1915	Chicago	300	21	10	Peugeot, Resta.....	98.61
1916	Des Moines.....	150	9	7	Mercedes, De Palma.....	92.60
1916	Twin City.....	150	14	7	Mercedes, Da Palma.....	91.08
1916	Sioux City.....	10	10	6	Duesenberg, D'Alene.....	79.60
1916	Sioux City.....	20	12	8	Premier, Wilcox.....	78.40
1916	Sioux City.....	50	15	8	Premier, Wilcox.....	72.57
1916	Omaha	50	8	5	Mercedes, De Palma.....	103.45
1916	Omaha	150	17	5	Peugeot, Resta.....	99.02
1916	Kansas City....	100	12	4	Mercedes, De Palma.....	58.48
1916	Tacoma Monta-marathon	300	14	6	Maxwell, Rickenbacher.....	89.30
1916	Chicago	50	8	5	Peugeot, Resta.....	100.42
1916	Cincinnati	300	28	6	Peugeot, Aitken.....	97.06
1916	Indianapolis	20	10	4	Peugeot, Aitken.....	95.08
1916	Indianapolis	50	9	5	Peugeot, Aitken.....	91.83
1916	Indianapolis	100	12	7	Peugeot, Aitken.....	89.44
1916	New York.....	250	31	10	Peugeot, Aitken.....	104.83
1916	Chicago	250	19	10	Peugeot, Resta.....	103.99
1916	New York.....	100	21	6	Peugeot, Aitken.....	105.95
1916	New York.....	50	11	5	Delage, Lecain.....	101.20
1916	Vanderbilt	294	17	4	Peugeot, Resta.....	86.98
1916	Grand Prize....	403	20	4	Peugeot, Wilcox-Aitken.....	85.59
1916	Ascot	150	12	4	Duesenberg, Rickenbacher....	67.54
1916	Uniontown.....	112	7	5	Frontenac, Chevrolet.....	90.69

Fifteen races were run that carried points, namely:

Race	Distance	Points
Metropolitan Trophy, New York	150	1,270
Indianapolis Sweepstakes.....	300	1,957
Chicago Derby.....	300	1,985
Des Moines.....	150	1,305
Minneapolis	150	1,290
Omaha	150	1,235
Tacoma Montamarathon.....	300	1,675
Cincinnati	300	1,910
Indianapolis	100	1,075
Astor Cup, New York.....	250	1,755
Chicago Sweepstakes.....	250	1,755
Harkness Trophy, New York...	100	1,060
Vanderbilt Cup, Santa Monica.	294	1,790
Grand Prize, Santa Monica....	403	1,920
Ascot, Los Angeles.....	150	1,350
Totals	3,447	23,332

Of this 23,332 points for the year, Resta took 4,100, Aitken 3,440, Rickenbacher 2,910, de Palma 1,790, and Earl Cooper 1,405, or a total of 13,645 was divided between the five leaders.

Less gold was placed on the ovals of chance this year than last. Last year $282,000 was offered as inducement to entrans, while this year the total was $244,083.33, the 33 cents being a bit of change that got into the pot through the sharing of the gate receipts at Sioux City and was helped by virtually sweeping up the floor of the Twin City box office on July 4 to find enough coin of the realm to allow one race of a card of three to be run.

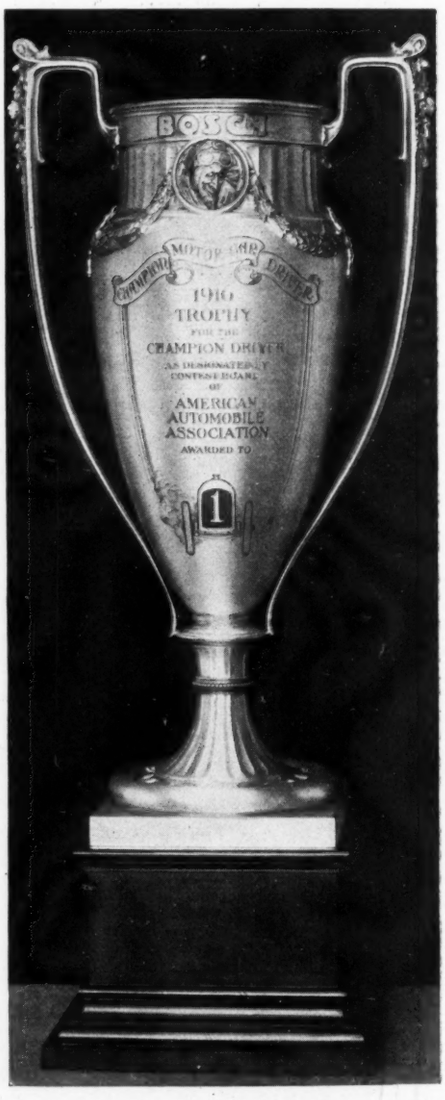
Resta's winnings for the season totaled $44,400, this for a total driving time of 11 hours, 1 minute and 40.40 seconds. Thus if he had been able to gage his earning capacity as to make this a mean average, his income for a year figuring 8 hours to the day and taking out Sundays and holidays would be, roughly $2,500,000. Were Resta's winnings all in silver dollars piled one upon the other they would make a pile 347 feet high. The foregoing figures are exclusive of his $7,000 special prize money offered by Goodrich and Bosch.

Aitken received an average of $24.36 a mile for all events in which he finished, his French mount grinding out $30,206 for him during the season. Rickenbacher was the next highest in winnings, his total being $20,050, while Ralph de Palma won $15,454 and D'Alene, $15,394.30. These five were the only drivers to win in excess of $10,000. The drivers taking more than $5,000 during the year were:

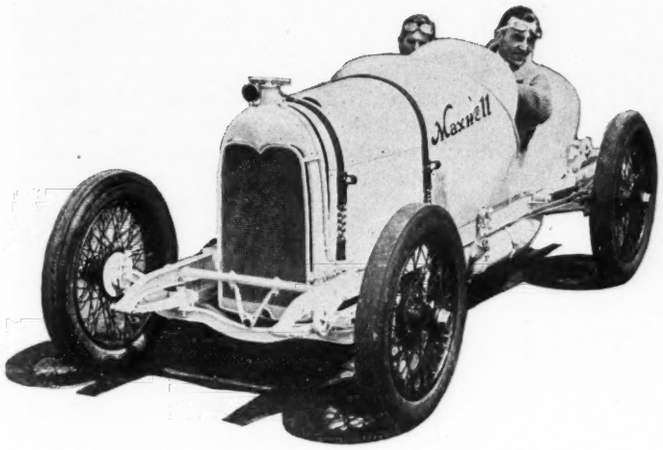
Frank Galvin $8,750, Wilcox $7,637.65, Lewis $8,286.12½, Mulford $6,850, Henderson $6,750, Christiaens $6,268.13, Cooper $6,750, and Milton $5,088.60. Other drivers who placed and won money—thirty in all—divided $55,948.52½. Twenty-four drivers failed to win prizes in any of the 1916 racing events.

Looking at the winnings from the standpoint of cars, the Peugeot leads with $89,879.57 to its credit, with the Duesenberg second, its total being $33,432.90, and Maxwell third with $23,800.

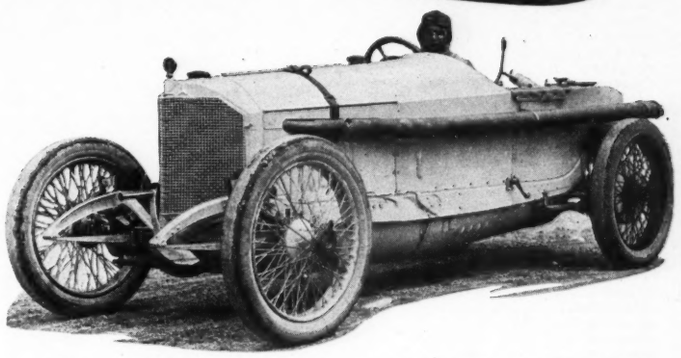
The middle of the 1916 season saw Ralph de Palma's Mercedes develop a case of physical disability and it got to be quite the common thing to find details of races in which Ralph piloted the Mercedes containing the phrase, "de Palma went out with——," so that by the time the season went into the shadow one seldom expected Ralph to win or place. The old stamina of the German steed seemed to have been spent. There is no denying that it has the speed and de Palma never favored his car—it had to stand punishment and he was a relentless driver from the start of a race until he either finished or docked the Mercedes. Where de Palma and Resta were entered it was a case of Greek meet Greek—this may be mixing the metaphors but Greece isn't so far from Italy—and the wily Dario never was humbled by Ralph once this year. Resta's first speedway race in this country—the Hoosier classic of 1915—was lost to de Palma and the Mercedes by 3½ minutes and not since that time has Resta taken de Palma's dust at the finish of a race. The most exciting duel between the two Italians came on the Chicago speedway in the opening event in June. A neck and neck battle was waged all through the first 290 miles. It looked like a toss-



The Bosch $1,000 trophy that goes to Resta as champion driver



Eddie Rickenbacher and his Maxwell mount that won the first point race of the year



Above—Earl Cooper in the Stutz he piloted into second place in both the Grand Prize and Vanderbilt events. Below—Ralph de Palma in the Mercedes that played him false so many times this year

up between de Palma and Resta. Then when only 4 miles from the goal and while he was leading the Mercedes began hitting on three and Ralph's stop at the pit, although only of a few seconds' duration, gave Resta a lead that the Mercedes could not overcome and instead of pulling down $12,000 first money Ralph took $6,000. Of course, it is largely a matter of conjecture whether de Palma could have kept ahead of Resta for those last 4 miles, for the Peugeot always seems to have a little reserve for a sprint any time Resta finds it necessary to make up a few lost seconds.

Out of twenty-seven races on speedways and including the Vanderbilt and Grand Prize events, Johnny Aitken came under the wire first in seven of them, Resta in six, de Palma in four, Rickenbacher three, Wilcox three, and Mulford, D'Alene and Lecain, one each. Second place was more proportionately distributed, D'Alene and Cooper taking second three times each, and Hughes, Milton, Lewis, Rickenbacher and Aitken each finished the season with two seconds to their credit. Of those who had one second each for the season chalked up there were ten, namely: Christiaens, Mulford, Devlin, Henderson, Devigne, Wilcox, de Palma, O'Donnell, Galvin and Merz.

Lewis Entered Most Races

Dave Lewis entered more races than any other driver, having participated in twenty-one meets and placing in twelve. He drove 1,392 miles in the races he finished, averaging $5.96 a mile, a total of $8,286.12½. In the early season he piloted a Crawford and later the Hoskins and Premier. Rickenbacher entered nineteen races, took three firsts, two seconds, two thirds, one fourth and was unplaced in eleven. His total mileage was 1,320 miles, each one of which paid him $15.18. Rick's teammate, Henderson, entered fifteen meets and emerged with place nine times, ranging from second to seventh. Henderson drove more miles than any other driver in finishing meets. His total mileage was 1,420 and his winnings were at the rate of $4.75 a mile, or $6,750.

Buzane started in fourteen races and was unplaced in eleven. D'Alene and Aitken each started in thirteen events and each unplaced four times. It seems a coincidence that D'Alene should have been entered in thirteen events, should have won $13 a mile for the 1,180 miles he drove and that he should have carried No. 13 on his Duesenberg in almost every race during the season. This was the first year No. 13 has found favor with racing drivers and some made it quite plain that D'Alene, in their estimation, courted misfortune by carrying the hoodoo number into the meets.

Probably the driver with the greatest hard luck of the season was Rawlings, who came down from the north to clean up in the West Duluth Special. He entered in eight races, placed in one at Sioux City and during the season won $8.17.

Enough of individuals; let's look at things mechanical. First place went to Peugeots fourteen times, Mercedes five times, Maxwell three times, Premier twice and Delage, Duesenberg and Frontenac once each. In starts, Duesenbergs lead with sixty and Peugeot was second with forty-three. Crawfords were third with forty-two, while Premiers and Delages had twenty-four and twenty-two starts, respectively. Maxwell and Duesenberg were unplaced thirty times, respectively. Crawfords were unplaced twenty-six times and Peugeots twenty-one.

The victorious Stutz of last year was brought out of seclusion on the Fourth of July at Minneapolis, Earl Cooper having made a contract to campaign the Indianapolis-made favorite of last year west of the Mississippi. He finished fifth and then took the Stutz back to California, where it was not heard from again until it took second in both the Vanderbilt and Grand Prize races last month and then finished out the season at Ascot by taking second again, although he may forfeit second place to Pullen.

Gil Anderson, the speedway champion of last year started the season as the pilot of a Premier, new to the realm of racing when the season began. About the middle of the season it was noised about that Gil found such fondness for his mount of last year that he purchased it from the Stutz company and took it out of the lobby of the Claypool hotel at Indianapolis, where loyal Hoosiers were permitted to gaze on the creation that set the highest mark in speedway racing last year at Sheepshead Bay.

Gil took the Stutz to Cincinnati for the inaugural 300-mile race on Labor Day. On Saturday a crankshaft bearing gave way in practice and the Norseman went to Indianapolis for another. Replacing the bearing involved working practically all Sunday night and Gil went into the race with very little rest. He lost control of his mount while coming out of the turn into the home stretch and it pirouetted up an embankment, turned four somersaults in mid-air, fell bottom-side-up on the track and spun around like the handle of an old-fashioned coffee mill. Gil suffered a broken leg and other injuries and his mechanic, Bert Shields, died later from a broken back. That was the extent of 1916 Stutz racing east of the Mississippi.

Much was expected of the French Grand Prix Delages that Harry Harkness imported in the early spring for a campaign this year, but misfortune came to them and their drivers more readily than money. In the first big race of the year Carl Lim-

STANDING OF DRIVERS IN CHAMPIONSHIP CONTEST

Drivers	Metropolitan Trophy—150 Miles	Indianapolis Sweepstakes—300 Miles	Chicago Derby—300 Miles	Des Moines Speedway—150 Miles	Minneapolis Twin City—150 Miles	Omaha Sweepstakes—150 Miles	Tacoma Trophy—300 Miles	Cincinnati Inaugural—300 Miles	Indianapolis Harvest Classic—100 Miles	Astor Cup Race—250 Miles	Chicago Sweepstakes—250 Miles	Harkness Trophy Race—100 Miles	Vanderbilt Cup Race—294 Miles	American Grand Prix—403 Miles	Ascot (Cal.) Speedway Race—200 Miles	TOTALS
Resta	..	900	900	..	..	600	..	..	..	..	800	..	900	..	..	4100
DePalma	..	..	470	600	600	..	120	..	..	..	..	..	..	..	..	1790
Aitken	..	..	..	..	320	..	..	900	500	800	420	500	..	..	..	3440
Rickenb'r.	600	..	..	170	..	..	800	..	..	420	220	..	..	..	700	2910
D'Alene	..	470	40	..	..	..	..	470	140	..	..	..	..	..	..	1120
Milton	..	..	..	..	90	170	420	..	..	10	..	..	..	..	..	690
Mulford	..	240	..	35	..	320	..	..	..	25	..	..	..	..	..	620
Christiaens	..	130	240	..	170	..	..	..	..	..	..	..	..	..	..	540
Henderson	..	22	..	320	..	90	70	..	15	..	70	80	..	..	..	667
Lewis	..	..	20	90	..	..	220	..	50	..	120	..	..	..	..	500
Galvin	..	..	80	20	..	..	..	240	..	..	45	260	..	..	..	645
Devigne	320	..	..	..	..	..	..	..	..	30	..	..	..	..	..	350
Hughes	..	..	..	..	..	..	..	..	260	15	..	..	..	..	..	275
Vail	170	..	50	..	..	..	..	..	..	220	10	..	..	..	..	450
Buzane	..	..	..	..	..	..	..	130	80	..	..	..	..	..	..	210
O'Donnell	..	..	130	..	55	..	..	..	..	..	..	..	..	..	..	185
Devlin	90	..	..	..	..	..	..	50	..	..	..	..	..	..	..	140
Klein	..	..	..	..	..	..	..	80	..	45	..	..	..	..	..	125
Oldfield	..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	80
Toft	..	..	..	..	..	..	45	..	30	..	..	..	..	..	..	75
Haibe	..	20	..	..	..	..	..	40	..	..	..	..	..	..	..	60
Stringer	..	..	..	..	..	55	..	..	..	..	..	..	..	..	..	55
Adams	55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	55
Cooper	..	..	..	55	..	..	..	..	..	..	..	..	470	520	360	1405
Wilcox	..	40	..	..	..	..	..	..	..	..	..	140	..	416	..	596
Chandler	..	25	..	15	..	..	..	..	..	..	..	..	..	..	..	40
Watson	35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
Sorenson	..	..	..	..	35	..	..	..	..	..	..	..	..	..	..	35
Johnson	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	30
Gable	..	..	30	..	..	..	..	..	..	..	15	..	..	..	..	45
McCarthy	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	25
Muller	..	..	..	..	20	..	..	..	..	..	..	..	..	..	..	20
Lecain	..	..	..	..	..	..	..	..	..	120	..	..	..	..	..	120
Pullen	..	..	..	..	..	..	..	..	..	70	..	..	..	..	..	70
De Vore	..	..	..	..	..	..	..	..	..	..	30	50	..	..	..	80
Burt	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..	25
Benedict	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	30
Weightman	..	..	..	..	..	..	..	..	..	..	..	..	240	..	..	240
Roads	..	..	..	..	..	..	..	..	..	..	..	..	180	140	..	320
Patterson	..	..	..	..	..	..	..	..	..	..	..	..	..	270	..	270
Pullen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	190	190
Ruckstell	..	..	..	..	..	..	..	..	..	..	..	..	..	..	100	100

than on any other kind of surfacing, New York, Chicago and Omaha leading all others and being the only courses on which 100 miles an hour, or better, has been attained this year in competiton.

One race was not considered in the foregoing compilation, this being a 150-mile event taken by Eddie O'Donnell in a Duesenberg before the regular 1916 season opened.

Probably the performance of Hudsons deserves special mention since they have placed in many races this year. Ira Vail went into the Metropolitan trophy event at the beginning of the season and placed a Hudson and henceforth piloted this mount rather assiduously in the chase for prizes. Ralph Mulford tooled one on certain occasions and A. H. Patterson went through the Grand Prize race of 403 miles in a Hudson without a stop.

Death took its toll in 1916. Bob Burman was killed at Corona, Carl Lemberg at New York, Dan Colombo, Franchi's mechanic, at Omaha, Bert Shields, Gil Anderson's mechanic, at Cincinnati, Lewis Jackson at Santa Monica and Hughie Hughes, Frank Galvin and Gaston Weigle, Galvin's mechanic, at Uniontown. Tom Rooney has been incapacitated all season by a broken leg snapped when his Premier wrecked at Indianapolis. It refused to knit. Gil Anderson was injured at Cincinnati and O'Donnell nursed a broken arm during the summer as the result of going through a fence at Kansas City.

berg was killed at Sheepshead Bay and his car burned. At Indianapolis Jack Lecain turned over with his Delage mount and was out of racing until toward the end of the season, nursing a broken leg. Aldo Franchi's Peusun, another Harkness entry, went through the so-called safety wall at Omaha and his mechanic, Don Colombo, lost his life.

The epidemic of speedway building that swept the country last year was not so much in evidence this season. Cincinnati opened a 2-mile board oval, Uniontown, Pa., a 1⅛-mile board track and these two with reconstructed Ascot constitute the addition to speedways this year. Prior to 1915 there were but three courses given speedway classification, but 1915 saw six additions, so that now there are twelve courses in the speedway class. Indianapolis is the only one with brick surface. Sioux City has a 2-mile course of dirt with banked turns, Providence, R. I., has a 1-mile course with asphaltum surface, and the Twin City track is 2-mile with concrete surface. Ascot speedway at Los Angeles is a 1-mile course with asphalt surface, while the Tacoma oval is board with asphaltum surface. New York and Chicago have 2-mile board tracks, Omaha and Uniontown 1⅛-mile board ovals and Des Moines 1-mile board track.

Speed on the board ovals is greater

Resta receives floral tribute and is proclaimed champion at Ascot track Thanksgiving day. At the extreme left is Frank Chance, "the P. L. of baseball," who acted as referee

Road Racing Honors to Eddie O'Donnell

WITH the mushroom growth of speedways in the last 2 years, road racing seems to become a back number. In previous years there have been a number of races over road courses, while in 1916 there were only three road events and these were of minor importance. The Vanderbilt and Grand Prize races, while not literally track races, are classed with the speedway events this year by reason of their having carried points in the championship reward and the fact that they were run over the Santa Monica course, most of which is practically a boulevard and thus has not the features of dirt road courses.

Eddie O'Donnell leads in the number of firsts in the early season road events having taken the Corona 300-mile race April 8 and the 300-mile Raisin classic April 29. George Hill, formerly mechanic for Barney Oldfield, won the Gardena road race May 6.

O'Donnell took the 300-mile Corona race in a Duesenburg in 86.5 miles per hour, falling just a little short of Pullen's record of 87.8 miles per hour set the previous year. His time for the 300-mile Raisin classic was considerably slower, his average being only 61.01 miles per hour. The Gardena event, won by Hill, was unique in that it was for semi-professionals and no admission fee was charged. Its length was 75 miles and the time of the winner was 1 hr., 47 min. and 13 sec. The Elgin road races were abandoned.

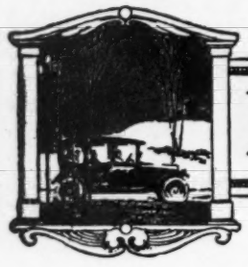
O'Donnell's victory at Corona was overshadowed by the death of Bob Burman, whose car was wrecked near the end of the race.

FINISH TIMES AND MILES PER HOUR OF ALL PLACERS IN 1916 SPEEDWAY RACES

M.P.H.	Distance	Car	Driver	Race
106.71	20	Peugeot	Aitken	New York
105.95	100	Peugeot	Aitken	New York
105.71	100	Premier	Galvin	New York
104.90	100	Peugeot	Wilcox	New York
104.83	250	Peugeot	Aitken	New York
104.54	20	Sunbeam	Christiaens	New York
104.34	50	Peugeot	Mulford	New York
104.32	20	Maxwell	Rickenbacher	New York
104.32	20	Delage	Limberg	New York
104.20	50	Delage	Lecain	New York
103.99	250	Peugeot	Resta	Chicago
103.90	250	Maxwell	Rickenbacher	New York
103.65	250	Peugeot	Aitken	Chicago
103.45	50	Mercedes	De Palma	Omaha
102.08	250	Maxwell	Rickenbacher	Chicago
101.31	100	Maxwel.	Henderson	New York
101.30	100	Duesenberg	Devore	New York
100.90	100	Benedict Spcl.	Benedict	New York
100.42	50	Peugeot	Resta	Chicago
100.35	20	Maxwell	Henderson	New York
100.19	50	Hoskins	Lewis	Chicago
99.89	50	Maxwell	Rickenbacher	Omaha
99.61	50	Maxwell	Henderson	Omaha
99.25	50	Duesenberg	Milton	New York
99.11	50	Duesenberg	Devlin	New York
99.10	50	Pugh Special	Meyer	New York
99.09	50	Peusun	Franchi	New York
99.02	150	Peugeot	Resta	Omaha
99.00	50	Duesenberg	Devigne	New York
98.94	50	Delage	Limberg	New York
98.61	300	Peugeot	Resta	Chicago
98.39	150	Peugeot	Mulford	Omaha
98.37	250	Premier	Lewis	Chicago
98.34	250	Maxwell	Henderson	Chicago
98.25	50	Hoskins	Hughes	New York
97.82	50	Duesenberg	Buzane	Chicago
97.81	250	Premier	Galvin	Chicago
97.60	300	Mercedes	De Palma	Chicago
97.40	250	Hudson	Vail	New York
97.30	150	Duesenberg	Milton	Omaha
97.06	300	Peugeot	Aitken	Cincinnati
97.00	250	Delage	Lecain	New York
96.53	150	Maxwell	Rickenbacher	New York
95.78	300	Sunbeam	Christiaens	Chicago
95.48	300	Duesenberg	O'Donnell	Chicago
95.39	50	Sunbeam	Galvin	Chicago
95.20	250	Mercer	Pullen	New York
95.08	20	Peugeot	Aitken	Indianapolis
95.03	20	Premier	Wilcox	Indianapolis
95.01	300	Duesenberg	D'Alene	Cincinnati
94.89	50	Crawford	Lewis	Omaha
94.80	250	Crawford	Klein	New York
94.60	250	Delage	Devigne	New York
94.56	150	Delage	Devigne	New York
94.54	300	Sunbeam	Galvin	Chicago
94.48	300	Hudson	Vail	Chicago
93.58	50	Duesenberg	D'Alene	Chicago
93.24	300	Duesenberg	D'Alene	Chicago
92.60	150	Mercedes	De Palma	Des Moines
92.30	250	Duesenberg	Mulford	New York
92.10	250	Hoskins	Hughes	New York
91.90	300	Burman Spcl.	Gable	Chicago
91.83	50	Peugeot	Aitken	Indianapolis
91.81	50	Hoskins	Hughes	Indianapolis
91.79	50	Sunbeam	Chevrolet	Indianapolis
91.25	300	Sunbeam	Galvin	Cincinnati
91.20	150	Maxwell	Henderson	Des Moines
91.08	150	Mercedes	De Palma	Twin City
90.82	20	Sunbeam	Chevrolet	Indianapolis
90.60	250	Duesenberg	Milton	New York
90.58	250	Duesenberg	Devore	Chicago
90.40	150	Maxwell	Rickenbacher	Des Moines
90.38	300	Hudson	McCarty	Chicago
90.15	150	Hudson	Vail	New York
90.00	150	Crawford	Lewis	Des Moines
90.00	150	Maxwell	Henderson	Omaha
89.90	150	Stutz	Cooper	Des Moines
89.75	50	Duesenberg	D'Alene	Indianapolis
8970.	150	Peugeot	Aitken	Twin City
89.44	100	Peugeot	Aitken	Indianapolis
89.30	300	Maxwell	Rickenbacher	Tacoma
89.01	100	Hoskins	Hughes	Indianapolis
88.63	300	Crawford	Lewis	Chicago
88.60	300	Duesenberg	Milton	Tacoma
88.60	100	Duesenberg	D'Alene	Indianapolis
88.53	300	Duesenberg	Buzane	Cincinnati
88.25	150	Mercer	Stringer	Omaha
88.04	20	Hoskins	Hughes	Indianapolis
88.00	300	Crawford	Lewis	Tacoma
87.99	50	Premier	Lewis	Indianapolis
87.44	100	Duesenberg	Buzane	Indianapolis
87.34	150	Duesenberg	Devlin	New York
87.00	300	Mercedes	De Palma	Tacoma
87.00	150	Sunbeam	Christiaens	Twin City
86.81	100	Premier	Lewis	Indianapolis
86.66	250	Ogren	Burt	Chicago
86.50	150	Duesenberg	Milton	Twin City
86.30	150	Hudson	Mulford	Des Moines
85.50	150	Sunbeam	Galvin	Des Moines
84.50	300	Maxwell	Henderson	Tacoma
84.40	300	Omar	Toft	Tacoma
84.05	300	Peugeot	Resta	Indianapolis
84.01	300	Crawford	Klein	Cincinnati
83.60	150	Hoskins	O'Donnell	Twin City
83.25	300	Duesenberg	D'Alene	Indianapolis
82.65	300	Peugeot	Mulford	Indianapolis
82.56	100	Omar	Toft	Indianapolis
82.51	100	Maxwell	Henderson	Indianapolis
81.13	250	Erbs Special	Gable	Chicago
81.08	150	Adams Special	Adams	New York
80.81	250	Hudson	Vail	Chicago
79.60	10	Duesenberg	D'Alene	Sioux City
79.60	300	Duesenberg	Devlin	Cincinnati
79.45	300	Sunbeam	Christaiens	Indianapolis
79.20	300	Delage	Oldfield	Indianapolis
78.40	20	Premier	Wilcox	Sioux City
78.35	300	Maxwell	Henderson	Indianapolis
78.03	10	Peugeot	Merz	Sioux City
77.60	150	Marso	Sorenson	Twin City
76.85	300	Premier	Wilcox	Indianapolis
75.04	20	Duesenberg	D'Alene	Sioux City
74.97	20	Crawford	Lewis	Sioux City
74.85	10	Crawford	Lewis	Sioux City
74.70	150	Dans l'Argent	Muller	Twin City
74.45	300	Crawford	Johnson	Indianapolis
74.05	300	Crawford	Chandler	Indianapolis
73.58	20	Peugeot	Merz	Sioux City
73.35	10	Premier	Wilcox	Sioux City
73.30	300	Ostewig	Haibe	Indianapolis
73.09	20	Peusun	Franchi	Sioux City
72.57	50	Premier	Wilcox	Sioux City
72.56	10	Peusun	Franchi	Sioux City
72.38	10	Burman Spl.	Gable	Sioux City
72.26	50	Crawford	Lewis	Sioux City
72.06	50	Crawford	Johnson	Sioux City
71.82	20	Crawford	Chandler	Sioux City
71.48	20	Crawford	Johnson	Sioux City
71.25	20	Delage	Devigne	Sioux City
70.17	50	Duesenberg	D'Alene	Sioux City
70.12	50	Crawford	Chandler	Sioux City
69.70	50	Peugeot	Merz	Sioux City
68.82	50	Peusun	Franchi	Sioux Ctiy
67.54	150	Duesenberg	Rickenbacker	Ascot
66.91	150	Stutz	Cooper	Ascot
66.64	150	Mercer	Pullen	Ascot
66.44	50	Duluth Spcl.	Rawlings	Sioux City
58.48	100	Mercedes	De Palma	Kansas City
57.02	100	Duesenberg	O'Donnell	Kansas City
52.98	100	Duesenberg	Buzane	Kansas City
50.29	100	Klein Special	Klein	Kansas City

VANDERBILT AND GRAND PRIZE

86.98	294	Peugeot	Resta	Santa Monica
85.59	403	Peugeot	Wilcox	Santa Monica
83.74	403	Stutz	Cooper	Santa Monica
79.46	294	Duesenberg	Weightman	Santa Monica
78.13	403	Hudson	Patterson	Santa Monica
83.74	294	Stutz	Cooper	Santa Monica
75.20	294	Hudson	Roads	Santa Monica
72.27	403	Hudson	Roads	Santa Monica



EDITORIAL PERSPECTIVES

The A. A. A. Championship

FOR the first time since motor car racing began in America, speed fans have been enabled to know exactly at any time during the past season the status of racing drivers. There has been no guesswork necessary this year. After each event of major rank, the standing of the drivers as race drivers has been known in actual figures as exactly as has the standing of the various clubs in the baseball leagues.

THIS has been made possible by the farsighted action of the Contest Board of the American Automobile Association in setting certain specified points as credits for place winners in the major events of the racing season with the goal as an A. A. A. championship award to the driver who at the end of the season had acquired the greatest number of points to his credit by the position in which he finished these events. So great has been the interest aroused that the four-cornered battle for first in the championship standing between Resta, Aitken, DePalma and Rickenbacher, and latterly the close finish between Resta and Aitken, has been the means of increasing attendance at speedway meets and, incidentally, in assuring in all but one or two instances the competition of the star drivers. That both of the leaders saw fit to withdraw from the final and decisive one at Ascot last week is to be regretted.

IN arranging for a championship award based on the showing of the drivers in the various races for this season, the American Automobile Association has taken up and carried forward this year the work that Motor Age had made an annual practice for many seasons past. That these awards for the season just closed and future ones have been and are to be in official hands is a matter of congratulation with Motor Age, and it is felt that by thus taking up the work, the governing body of motor racing in America has, to an extent, recognized some value in Motor Age's efforts in previous years.

THAT the decision of the Contest Board in awarding the championship to Resta was an inevitable one, goes without saying. The award was made automatically, and the finding was as definite as any other total of a series of figures. It was to be expected that instances would come up in which modifications in the original rules might become necessary or impromptu interpretations of those rules be required. Perhaps the question raised by the substitution during a race of one driver for another who had started the car, for the avowed purpose of increasing championship points of the former, was a problem not considered by the A. A. A. Contest Board before its occurrence, but in any event, this ruling upon this point cannot be considered anything but just and fair. Any other ruling would give the driver who had two cars to break up too much of an advantage over the driver whose team consisted of one car.

FOR the racing season of 1917, the A. A. A. championship award has undergone modifications which not only will be valuable in increasing the interest of the public in the progress of the various drivers toward the championship goal, but also will do much toward making sure that the stars in the racing firmament will appear at all the championship events. Also, what is, if anything, of more importance, is the fact that it is planned to announce the point awards for each of the various races at the beginning of the season.

IT is to be hoped that the governing body will find that such announcement is possible, because it detracts much from the interest of the coming events not to know whether by winning the event, sufficient points would be gained to place another driver in the lead. The fact that the leading driver must compete in all events of championship standing, predetermines the class of the field for each race next year. The lack of this was the main reason that preliminary announcement of point awards was impossible during the past season. It sometimes was not known whether more than one or two of the leading drivers would compete in an event until the starting gun was fired.

THE sportsmanship of the Bosch and Goodrich companies in making the A. A. A. championship award still more worth while in a financial way, without specifying equipment, is to be commended, and it is to be hoped that their trophy and awards will be repeated for next year.

Value of Proper Ignition

THE gasoline motor receives its power from the combustion of a mixture of vaporized liquid fuel and air. This combustion is chiefly dependent upon two factors—the quality of the mixture and the quality of the flame which ignites it. The quality of the mixture depends upon the quality of the liquid fuel and the quality of the carburetion system and on the design of the engine. Some of these factors are under the control of the motorist, others are not. It is a lamentable fact that the quality of the fuel liquid is decreasing, a fact which must be attributed chiefly to the increasing demand and diminishing supply. Carbureter manufacturers and motor manufacturers are bending every effort toward making up for this decrease in fuel quality by better design, but in spite of this the importance of the production of proper ignition flame is greater this year than ever before.

WHAT the manufacturers of ignition apparatus are doing toward improving the flame at the spark plug is told on other pages. What the motorist must do to see that the ignition apparatus functions properly, likewise is told on other pages. It is this latter which must be most carefully heeded by the motorist if he wishes to get the best results from his engine. A good spark is impossible if the contact breaker or timer has become fouled and dirty, or if a film of grease and dirt has been allowed to accumulate upon the distributer contacts. It is just as important, although not quite so frequently necessary, that these features of the ignition apparatus be cleaned periodically, as it is that the spark plugs are kept from becoming too dirty. It is easy, usually, to locate ignition trouble by short-circuiting the plugs to ground, for such troubles ordinarily are localized in the ignition of one cylinder.

Theory vs. Practice in Handling Traffic

Philadelphia Traffic Chief Criticizes Eno Plan and Suggests Changes

CAPTAIN William B. Mills, Chief of the Traffic Division of the Philadelphia department of public safety, is in accord with the object of William Phelps Eno in his effort to standardize traffic rules and believes in the practicability of some of his plans to that end. "I have high respect for Mr. Eno's system," said Captain Mills, "because it is based on an exhaustive, impartial investigation of the ordinances in force in many cities. But, while a good many of his plans are fine from a theoretical standpoint, they are not so good for practical use. As an example, the 'rotary system,' as mapped out in the Motor Age of September 28, is all right where there is room, but if it were necessary to tear down expensive buildings, the cost would be too great."

The Philadelphia traffic division has certain rules and regulations, but they are not set for all time, nor are they based on the rules and regulations of other cities. They are made and changed as often as new conditions, which are purely local, arise, and in some cases are the basis of regulation in other cities.

Captain Mills organized traffic regulations in Philadelphia 10 years ago. He has been in charge ever since. At that time he had a force of ten traffic officers working in various parts of the congested district—today he has 400.

Captain William B. Mills, chief of the Philadelphia traffic department of public safety

Standardization

"It is absolutely useless to standardize traffic regulations from the small town and city upwards. The only practical way is to start with the legislative body of the state, giving to the police authorities in the small towns and cities the privilege of regulating their own traffic. There are cases where this would not be practical, but I shall point them out. What this and other states want is more elastic laws. Some that we have are too elastic and some too drastic. As an example, if the state made a law fixing the speed limit in certain specified districts at 15 miles per hour motorists would not be confused when entering a strange town. We are now drafting a new law which will remove some of the objectionable features. Under the act local authorities will not be able to harass motorists, as they have in the past, with unnecessary, conflicting and embarrassing speed regulations. The law will make rules standard throughout the state.

"In this city we have parking zones. In one zone no parking is allowed at all. In other zones the privilege is limited to periods of 15 minutes, 30 minutes and 1 hour. There are no restrictions after 6 o'clock at night. This is one of the new necessities of traffic regulation in which Philadelphia has taken the lead.

"Before we made this ordinance we took a count and found that people were using the congested streets as a garage for from 1 to 13 hours each. In these centers there were on an average 3,500 cars at a time. We made a test to see how much we could restrict the privilege without removing it altogether. By limiting the parking to 1 hour we got no relief, so we tried 30 minutes with the same results. The same test was made with 5 minutes and we discovered that unless the privileges were removed entirely we could get no relief.

"When we first mapped out the zoning system there was much dissension, but now everybody is in favor of it, and not a few who first objected are now asking to have it extended. Another way in which we gained is that in the district where no parking is allowed it is possible to have two lanes of motor vehicle travel instead of one, and with the extra space we have the means of increasing it to four lanes on either side of the street, should that become necessary.

"Semaphores should be uniform both as to type and color in every part of the state. This is done with license tags, why not with semaphores? I am in favor of mechanical signals entirely and believe that in time they will take the place of whistles and voice signals, as well as those of the arm.

The voice and hand signals, as embodied in the Eno system, are too uncertain to admit of intelligent application and will sooner or later be a thing of the past.

"Here again I am at variance with Mr. Eno. His model ordinance provides for semaphores with yellow letters on a black background. The signals we will have will be discernible at a greater distance and are to be painted with dark blue letters on a yellow background.

"No one in this city has the right of way and no distinction is made of vehicles of any kind. Of course, in cases where ambulances, fire and patrol vehicles are in a hurry the situation is left up to the officer in charge of traffic. It is up to him to facilitate their progress as much as possible. U. S. mail trucks are treated the same as any other vehicle, which I believe is contrary to Article IV of Mr. Eno's ordinance.

Crosswalks

"I am not in accord with the system of marking out crosswalks so that the sides make a perfect square. The way we do it here is to make the markings a 'direct prolongation of the building and curb lines.' The proposed way makes it necessary for people to take a circuitous route to cross the street. People would surely disregard such a regulation, especially those in a hurry. Not only that but it would interfere with foot traffic coming at right angles.

"On some streets the traffic is so heavy that provisions must be made to keep motor vehicles moving. In the Eno ordinance, Article III, motor cars are not permitted to pass standing street cars. We make the same rule, but it applies only to the right side of the street on which the passengers alight. The busiest corner of this city is Juniper and Market streets. One thousand seven hundred and forty-two motor cars pass every hour during the rush period. We could not hold them up every time a street car stops, for the traffic would become unmanageable in a very few minutes. They are allowed to pass on the left side of the street on signal from the officer in charge. This rule applies to all streets on which there is a traffic in excess of 600 motor vehicles an hour.

Overland Convention Brings Dealers

Plans for Marketing 1917 Product Will Be Formulated at Toledo This Month

TOLEDO, O., Dec. 4—Special telegram—There are great doings in Toledo tonight, for the dealers' convention at the factory of the Willys-Overland Co. opened today with more than 1,200 dealers and guests present. All day the visitors were busy inspecting the 1917 models and visiting the plant. Tonight Harry Harper, the sales manager, formally opened the convention, which is to last until December 23, with an address of welcome.

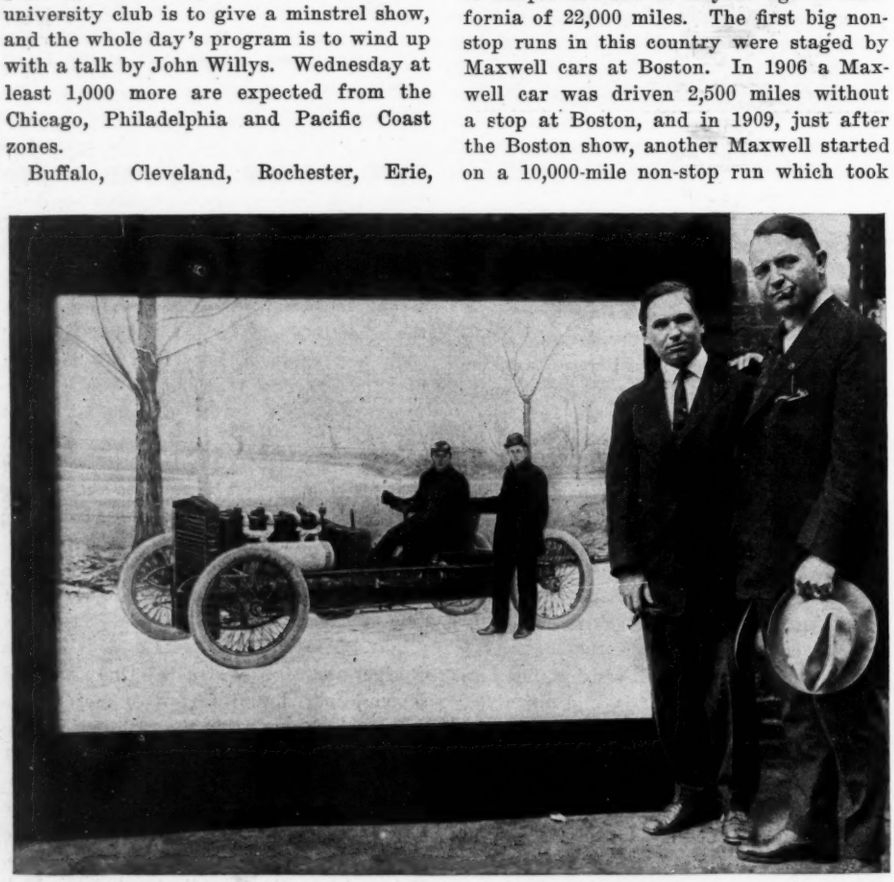
About 6,000 dealers are expected before all is over. Today saw a good start toward the 6,000, for these dealers were invited for the first hours of the reception, so to speak. The convention has been arranged so that various zones come on certain days. Today those from Atlanta, Denver and Omaha zones came. This included the dealers from Florida, Georgia, Alabama, the Carolinas, Tennessee, Louisiana, Kansas, Iowa, Nebraska, South Dakota, Utah, Idaho, Arizona and Colorado.

Tomorrow is one of their days also, and service sales and advertising talks will be featured. There will be music, for the Overland band is to play and the Overland glee club is to sing. Then the Overland university club is to give a minstrel show, and the whole day's program is to wind up with a talk by John Willys. Wednesday at least 1,000 more are expected from the Chicago, Philadelphia and Pacific Coast zones.

Buffalo, Cleveland, Rochester, Erie, Youngstown, Pittsburgh, Wheeling, Clarksburg, Huntington, Canton, Mansfield, Athens, Zanesville, Cambridge, Columbus and Dayton dealers and distributors will be here December 8 and 9. The following week will be given to Montana, North Dakota and the Dalles, St. Louis, New England and Kansas City zones, and the Michigan, Toledo, Fort Wayne, Kendallville and South Bend organizations are to come then also. On December 18 and 19 the South Dakota, Minnesota and Wisconsin dealers arrive, and the New York zone. Louisville, Lima and Evansville dealers are to bring the convention to a close December 20 and 21.

MAXWELL WANTS NEW RECORD

Boston, Mass., Dec. 2—The Maxwell non-motor stop car, which started here November 22 by Mayor Curley, is piling up the mileage. At noon today it had passed the 3,700 mark, and it is maintaining an average of 15 m.p.h. Manager E. A. McConaha of the New England branch and the three crews handling the car are now interested in trying to make a new record to eclipse the one of a year ago in California of 22,000 miles. The first big non-stop runs in this country were staged by Maxwell cars at Boston. In 1906 a Maxwell car was driven 2,500 miles without a stop at Boston, and in 1909, just after the Boston show, another Maxwell started on a 10,000-mile non-stop run which took a month, the car traversing the road from Boston to Worcester and return. The car now running has eclipsed the first record and is now approaching the second one. Unless a blizzard makes the roads impassable, the drivers expect to set a new record. Each day the car checks in at the Bay State A. A., where the seals are inspected.



$5,000 painting recently purchased by Barney Oldfield, showing the veteran driver seated in the famous "999" Ford racer. Henry Ford is standing beside him in the picture. The artist stands between the picture and Barney

BOSTON SHOW SPACE ALL SOLD

Boston, Mass., Dec. 2—Practically all the space for the Boston show, which opens in March, has been sold. Provisions may be made later to take care of a few late comers, but they will have to share space with someone else, and possibly go in the basement. The first floor will be given over entirely to cars, and the balconies will have the accessories. There will be more space available this year because the big dining room has been taken over for the next show and this will give a big slice of room. A small section of hallway will be used for a luncheon space like at New York. Paul Revere hall will again have cars there instead of accessories, so that the newcomers will be able to crowd in.

The trucks will be in the basement. Plans are under way to take the ballroom at the Copley Plaza as an auxiliary exhibit, and some of the dealers have agreed to go in there to show special cars that could not get into the regular spaces at Mechanics' building.

There was nothing to the rumor that the dealers were seeking the Billy Sunday tabernacle in which to hold a truck show, for it is too far from theregular show building.

WILLYS-OVERLAND TO INCREASE

Toledo, Dec. 1—The Willys-Overland Co. will increase its output this month to 10,000 cars, and this is to be increased each month until 18,000 is reached in March, 1917. The company also has made larger advertising plans. It will spend $3,000,000 for advertising next year, $1,000,000 more than in 1916.

FORD TRACTOR RECAPITALIZES

Dover, Del., Dec. 1—The Ford Tractor Co., Ltd., has filed a certificate, changing its name to the Ford Tractor Co., Inc., and increasing the capital stock from $1,000,000 to $10,000,000. The company was incorporated here Nov. 8.

SIGNAL CORPS VISITS DETROIT

New York, Dec. 1—That the Government thinks it worth while for the motor car manufacturer to take up the problem of the aeroplane was shown recently by the visits of the Signal Corps, representative of the army and navy, at Detroit, Buffalo and other points with a view to establishing aviation training stations at Detroit and Buffalo at least. For the Government is considering the possibility of

taking over what is known as the Joy Aviation Field in Detroit, and this is the testing ground purchased some time ago by the Packard company. The matter is only under contemplation, but the Government realizes that the motor car manufacturer is well qualified to carry out all work of aviation design and manufacture, and for this reason these two cities are being considered, Detroit because of its leadership as a motor car manufacturing center and Buffalo because of the volume of aeroplane manufacture at present carried on there.

Howard Coffin of the National Council of National Safety and the Navy Consulting Board accompanied the Signal Corps on its investigation.

BRINGS SUIT TO COLLECT

Rockford, Ill., Dec. 2—To determine whether a garage owner can charge by the hour when taking care of a motor car for a year or whether the owner of the car should be held liable only for a general charge for overhauling, J. E. Gustaffen brought suit against Dr. T. H. Culhane of this city when his bill of $1,300 was met with a proffer of $650. Gustaffen charged 1,158 hours of work at 75 cents an hour. Supplies brought the total to $1,300. Culhane offered to pay $650. Experts from other garages testified that 300 or 400 hours were enough to give the car a complete overhauling. The trial lasted several days and attracted much attention. Gustaffen received a judgment for $970.

MILWAUKEE GASOLINE RISES

Milwaukee, Wis., Dec. 2—Gasoline prices on the so-called 65 degree test were advanced 1½ cents a gallon and on the 70 degree test, 2 cents a gallon in Milwaukee Dec. 1. The prices on the lower tests are undisturbed from the change effective Oct. 11. The higher tests are in greater demand in winter, which accounts for the differentiation in price advances.

The general demand for gasoline has shown only a slight decrease this year, while in former years the requirements of motorists in November were much less than in October. Buying is on an unusually heavy scale, due partly to the excellent weather in this part of the country.

HAROLD PARKER DIES

Boston, Mass., Dec. 1—Harold Parker, for several years chairman of the Massachusetts highway commission, died at his home at Lancaster day before yesterday. As a road builder he had a wide reputation. During his office Massachusetts built many miles of fine highways and kept them in good shape. On leaving the commission he acted in an advisory capacity to Governor Dix of New York on road building in that state and became vice-president of the Hassam Paving Co. He had been president of the Massachusetts Highway Association and an officer of the American Highway Association.

Several Companies Raise Car Prices

Mitchell, Saxon, Winton and Allen Announce Boosts in Cost to Take Effect Soon

CHICAGO, Dec. 5—Four concerns have announced price increases since the last issue of Motor Age went to press. With the constant raises coming with regularity next week it seems likely that all car prices may ultimately be increased.

SAXON RAISES PRICE

Detroit, Mich., Dec. 5—Special telegram—The Saxon Motor Car Co. will increase its prices from $815 to $865, to take effect January 1, due to increased cost of labor and material.

CLOSED ALLENS TO ADVANCE

Fostoria, O., Dec. 2—An advance of $100 in the price of both the Allen coupe sedan, effective after January 1, 1917, is announced. These closed models now sell at $1,075 and $1.095 respectively. The new prices will be $1,175 and $1,195.

MITCHELL TO ADVANCE PRICE

Racine, Wis., Dec. 2—An increase of $100 in the price of the Mitchell and the Mitchell Junior became effective December 1.

WINTON MAKES $200 INCREASE

Cleveland, Ohio, Dec. 1—The Winton Co. announces that, beginning Dec. 15, the price of the model 33 will be $200 higher. The advance will apply to both open and closed cars.

TRACTOR TRAIN IS TESTED

Marfa, Texas, Dec. 1—The recent initial test run of the military tractor train, for use in the Big Bend region of the upper Rio Grande border, is said to have come up to the army requirements in every way. The run was conducted under the direction of Captain Harry A. Hegeman, quartermaster in charge of the motor truck shops at Fort Sam Houston, and was between Marfa and Presidio, a distance of 63 miles, over a desert region.

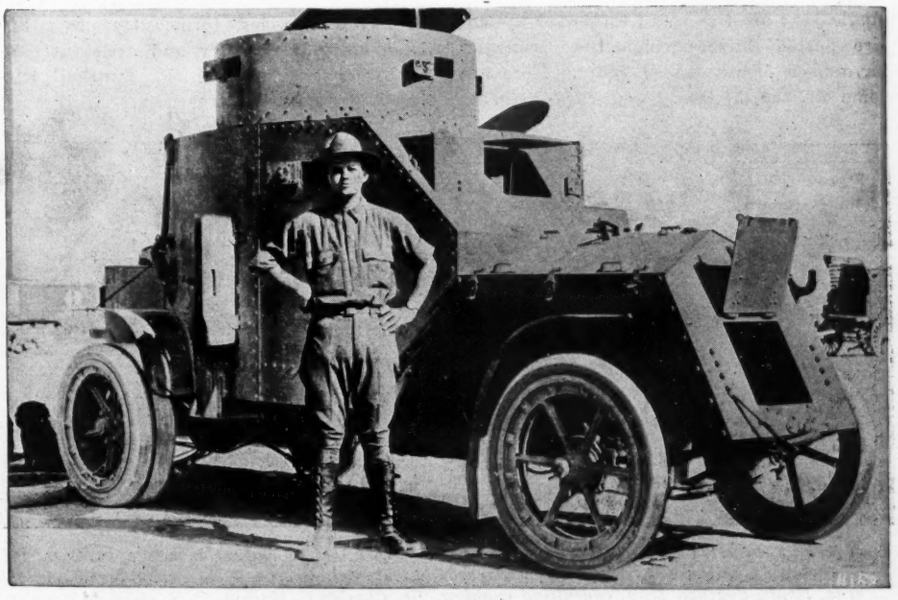
The equipment consisted of a 75 h.p. caterpillar tractor and four trailers, each equipped with caterpillar tread instead of wheels. Each trailer has a cargo-carrying capacity of 15 tons. The trip was made at an average speed of about 2½ m.p.h. over a road that is a road in name only. The train was loaded to full capacity with supplies on its outgoing trip on the test.

$10,000 FOR NEW FUEL

New York, Dec. 1—A $10,000 prize for fuel research is announced by the Aero Club. The will of the late S. H. Valentine, formerly governor of the Aero Club of America, provides this sum for the encouragement of aircraft which do not use gasoline as a fuel. Mr. Valentine's bequest is expected to stimulate interest in the discovery of a new fuel, lighter than gasoline, which will make longer flights possible.

ELGIN HAS TEST TRACK

Chicago, Dec. 4—The Elgin Motor Car Co. has just completed a ¾-mile test track over which every car is tested before shipment. The Elgin factory is also located near a steep hill which provides opportunity to test the hillclimbing qualities of every car.



Armored White truck in border service

Chauffeur Contest Ends

Winton's Annual Prize Competition Shows High Mileage at Low Maintenance Cost

Twenty-five Drivers Get a Total of 290,000 Miles; Expense $5.90

CLEVELAND, Ohio, Dec. 1—The results of the ninth annual contest for employed chauffeurs conducted by the Winton Co. show that twenty-five chauffeurs drove Winton sixes a total distance of 290,426.7 miles at a total repair expense of $5.90. These results are taken from the sworn reports of owners and chauffeurs. First prize was awarded to George Felt, Minneapolis, chauffeur for H. D. McCord.

The Winton Co. awarded $3,500 in all in this contest. William C. Ball, chauffeur for F. F. Rowe, Kalamazoo, was second and received $400. Alfred Shibley, chauffeur for J. W. Lloyd, Pittsburgh, and W. W. Newsome, chauffeur for M. R. Hirsch, Atlanta, won third and fourth prizes respectively, $300 and $200. Prizes of $100 were awarded to the following: A. H. Klein, Chicago; Ralph H. Lee, Millville, N. J.; G. M. Lewis, Syracuse; Henry Belanger, Manchester, N. H.; George T. Macone, Stockbridge, Mass.; Thomas Murren, Boston; Jospeh Castellucci, West Medford, Mass.; Edward M. Armstrong, Boston; Robert Clements, Andover, Mass.; P. O. Hale, West Newton, Mass.; T. L. Quigley, Elmira, N. Y.; Herbert Lewis, Orange, N. J.; Charles Schmidt, St. Louis; W. Desillier, Swampscott, Mass.; W. L. Woods, Brooklyn; A. P. Holst, Chicago; E. P. Carey, Minneapolis; Albert Hitchen, Los Angeles; Chris McDermott, Utica, N. Y.; P. J. Farrington, Los Angeles; and F. H. Coyston, Pittsburgh.

More interesting than the report for any single year are the grand totals for the entire period during which these contests have been conducted—9 years. Here are some of the figures: 536 cars traveled 5,000 miles or more; these 536 cars had a total mileage of 5,509,049.3 miles; the average miles for car were 10,278; the total repair expense for all cars was $5,640.64; the average expense for car was $10.52; the average repair expense for car for 1,000 miles was $1.03, or about one-tenth cent per mile.

The total distance traveled by these Winton six cars is greater than that for 220 tours around the earth on the path of the equator. And the average repair expense shows that a Winton six owner traveling 25,000 miles in a year might have expenses of $25.75 per annum.

PREST-O-LITE ASKS INJUNCTION

Dallas, Tex., Dec. 2—A suit has been filed in the Federal court at Houston seeking an injunction, also damages in the sum of $5,000 and alleging infringement of trade mark by the Prest-O-Lite Co. of New York against the Emmert Machine and Auto Co., and Claude Watson, Emil Emmert and Gustave Emmert.

DELCO MAKER BREAKS RECORD

Dayton, Ohio, Dec. 1—All former records for the Dayton Enginering Laboratories Co., maker of the Delco systems, were broken during November, when 1,250 complete systems were shipped daily. The week ending November was the largest in the history of the company. In that week 8,139 were shipped. Altogether, the company shipped 31,228 complete systems in November.

ANOTHER OFFICE FOR MORSE

Detroit, Dec. 1—E. C. Morse, vice-president in charge of the selling division of the Chalmers Motor Co., has been elected general manager. Mr. Morse entered the Chalmers company 2 months ago and was placed in charge of the sales, service and advertising departments. The new office does not affect his former position.

Other changes in the Chalmers personnel are: W. P. Kiser, former treasurer, has been elected secretary and assistant general manager, and D. P. Turnbull succeeds Mr. Kiser as treasurer.

Plants May Suspend

Car Shortage at Detroit May Cause Some Makers to Close Down Factories

Immediate Relief Is Necessary If Business Is Not to Stagnate

DETROIT, Dec. 2—More than $10,000,000 worth of motor cars are held up awaiting freight cars for shipment, and many motor car makers may be forced to suspend manufacture if relief is not immediately forthcoming. These were statements made yesterday at a meeting of the traffic committee of the National Automobile Chamber of Commerce held in Detroit.

The committee named two committees who will visit railroad officials throughout the Central Freight Association territory and in the East to urge compliance with the Interstate Commerce Commission's recommendation that motor cars be returned promptly to their home lines.

The men named on the traffic committees include H. R. Moule, Chalmers Motor Car Co.; A. C. Westfall, Cadillac Motor Car Co.; C. W. Eggers, Willys-Overland Co.; J. R. Graham, Reo Motor Car Co., and H. M. Newlin, Maxwell Motor Co.

"There are approximately 30,000 motor freight cars in the Central Freight Association territory and one eastern trunk lines that are being used for all kinds of shipments other than motor cars," said Mr. Eggers, following yesterday's meeting, "and we shall try to obtain the return of these cars. We shall point out to the railroad officials the recommendation made by the Interstate Commerce Commission in connection with its order calling for a redistribution of freight cars, to the effect that motor vehicles cars should be returned to their home lines."

CADILLAC NAME CAUSES SUIT

Detroit, Dec. 1—The Cadillac Motor Co. has started suit against the Cadillac Auto Truck Co. of Cadillac, Mich., asking for an

Taken at the Mt. Clemens, Mich., aviation field. From left to right the men are W. H. H. Hutton, Henry B. Joy, Charles B. King, Dr. H. C. Dickinson of the U. S. Bureau of Standards, Lieut. Col. George D. Squier, Eugene Lewis, Dr. W. Stratton director of Bureau of Standards, Henry Souther, U. S. consulting engineer. Dr. Charles F. Marvin, U. S. chief of Weather Bureau, Howard E. Coffin, S. D. Waldon, Lieut. W. G. Child, Ray D. Chapin, Dr. Charles D. Walcott and Russell Huff

injunction restraining the latter firm from using the name "Cadillac," "Cadillac Auto Truck Co." or any other name prejudicial to the interests of the Detroit concern.

To establish proprietorship in the name, the Cadillac Motor Co. cites the fact that it became the successor of the Cadillac Automobile Co. in 1905, while the Cadillac Auto Truck Co. was organized in 1915. It also states that it has been making Cadillac trucks for the last 3 years and that many letters showing that the public is confused have been received.

The plaintiff claims further that it sent an agent to Cadillac to interview the officers of the new concern with the result that the Detroit concern wrote on October 27, 1915, expressing gratification of the name "Acme," which the new firm used for its product, and suggesting that the corporation call itself "The Auto Truck Co. of Cadillac." No date for the hearing has been set.

LINCOLN HIGHWAY SPEEDS FREIGHT

New York, Dec. 4—Since the freight congestion has become so acute the value of the Lincoln highway is very evident, as regular and speedy deliveries have been found possible by motor truck from as far west as Pittsburgh, 384 miles away, and regular trips are made on exactly schedule time.

One producer is making all his New York deliveries this way. Fourteen cars leave over the Lincoln highway from his plant each day. The time gained in this way makes it more economical to ship by truck than by rail.

The Lincoln highway is hard-surfaced for the entire distance and is direct and well marked. The condition of freight facilities on the railroad lines paralleling the highway from Pittsburgh to New York has brought the commercial value of the highway home to many merchants who never realized it before, and the motor truck delivery is the result.

Ford Case Decision Soon

Testimony Is all in and Final Pleas by Both Sides Have Been Made This Week

Attorneys Declare Largest Shareholder Should Dominate Co.

DETROIT, Dec. 1—The final hearing of the suit instituted by Dodge Bros. against the Ford Motor Co. to restrain Henry Ford from spending undivided profits in factory expansion has closed, and it now rests with the judges who heard the case to hand down a decision in this case in which the public has learned of the world-wide Ford plans that would flood the nations with cars and of the great expenditures necessary to do this.

In the summing up of the case, the attorneys for Dodge Bros. state in effect:

"No one can, and no one should, complain that a man owning 58 per cent of the stock of a corporation dominates its affairs, so long as he keeps it running within the proper lines. Mr. Ford's policy of increasing wages, of increasing the number of employees, and of lowering the price of his car to the buyer have all been important factors in the building up of Detroit, but it is outside the law.

"Public policy demands that no corporation should be permitted to determine for itself the extent to which its capital may be increased without distribution. The state of Michigan says no corporation may be formed with more than $25,000,000 capital, yet the Ford Co. had more than $50,000,000 August 1. Mr. Ford admits that a concern making 10,000 cars a year could not compete with him—the question of capitalization is an economic one.

"The statute specifically provides that a smelter company in Michigan may not be organized with more than $10,000,000 capital—Mr. Ford proposes to spend $12,000,000 in the smelter plant at the Rouge. Mr. Ford sold land to his corporation for $10,000 an acre that had cost him $3,500 an acre. Doubtless the land is easily worth $10,000 an acre—but the deal is illegal just the same.

"If Mr. Ford makes 1,000,000 cars next year at the low price proposed he will create an economic, if not a legal, monopoly. Last year the Ford Motor Co. sold 500,000 cars at a profit of about $60,000,000. It now proposes to make 1,000,000 cars at a profit of $80 less per car. There may be cases where a corporation is justified in making extensions at a financial loss, but this is not one of them. There are only 2,000,000 possible purchasers in the United States, and he intends to produce 1,000,000 cars this year when 340,000 cars at the old price would have given the same profit he will get on that 1,000,000."

Ford Attorneys Reply

And the reply attorneys for the Ford company made to previous arguments was, in part:

"The evidence shows the Ford directorate honestly exercised its discretion in the corporation's affairs and was not led around by anybody. The company is not going outside its corporate powers unless the questioned activity be so remote from the charter's scope as to be in a sense auxiliary to it. What difference whether the Ford plant is melting ore or melting pig iron in the course of its work? No such distinction can be drawn in discussing the proposed smelter.

"The court cannot interfere in the present case unless it find a presumption of bad faith—deliberate bad faith—and that is not claimed. This injunction has never been needed and it is a useless hindrance. If the court finally upholds the Dodge claim, there will be money enough in the Ford treasury to pay up.

"The statutory capital stock is not synonymous with 'capital assets.' If the latter are to be limited it is a matter for legislative, not judicial, action.

British Tommies trying, with the assistance of another motor car, to pull a heavy armored car out of the sand

War Develops German Industry

Chassis Design Stronger and Lighter—Lack of Rubber Brings Out Synthetic Product for Tires

By E. A. Langdon

GERMANY'S motor car industry has played a part of the utmost importance in enabling that country to withstand the assaults of its enemies since the beginning of the war. Needless to point out, this industry has not escaped the influences and effects of the great conflict and these results of the abnormal conditions created have been of both a detrimental and a beneficial character. For example, most of the cars which were drafted for service at the beginning of the war have long since been consigned to the army's great clearing houses for material, where they have been dissected and their various units used for other purposes or in repair work, or the rusty skeletons of their chassis, plucked bare of every detachable part and accessory, are gradually disintegrating in the mire of a thousand battlefields.

Chassis construction has undergone a marked change, both in design and materials employed. Chassis are stronger and lighter, due to the elimination of many special parts formerly used, but now discarded for reasons of economy, and also because of the marked increase in the use of aluminum, not only for crankcases, gearboxes, etc., but also for such parts as valves, shafts, cylinder castings and other units for which an immense amount of copper, steel and iron was formerly required. A number of aluminum alloys of great strength has made this wide use of the metal possible, one of these alloys closely resembling the qualities of steel.

Make Gas From Coal

An ingenious method of supplying motor vehicle fuel has enabled the Germans to solve the gasoline shortage problem, which has at times remotely threatened to become serious since the beginning of the war, in spite of the enormous quantities of the fuel which Roumania practically made a compulsory condition to the purchase of wheat by Germany. Gas distilled from coal, and somewhat resembling illuminating gas in a liquefied or highly compressed state, is carried in steel tanks and fed to the engine through reduction valves.

One of the most important developments directly due to the war is claimed by the Germans to be the perfection of the manufacture of tires and other articles, in which rubber was formerly used, by synthetic processes. They also state that this product will compete successfully in quantity and quality with natural rubber in the world's markets following the termination of hostilities.

German motor car parts and accessory manufacturers, as well as the truck builders, are being fused into a powerful, compact unit of industry and are counting on their co-operative abilities to overcome trade barriers existing against their products at the end of the European struggle. It is even possible that agricultural and commercial motor trucks and tractors will represent a majority of the products of the industry for two reasons. One of these reasons is the large demand for these machines, due to the scarcity of horses caused by the war, and the other is the economical advantage of standardized production.

Different Type Used

The cars used by the army, at the present time, differ considerably from those used at first. Needless to state, there is hardly a car left which was drafted for service at the beginning of the war, except a few luxurious private cars used by the officers of the general staff and German princes. The supply of machines, however, must be replenished, and it is remarkable how, under the stress of necessity, German engineers have given up more and more special parts which went to make the machines as nearly perfect as their builders could conceive them; hence the design is approaching an ideal of strength and simplicity, both in regard to design and materials used.

The most striking feature, perhaps, is the immensely extensive use of aluminum, not only for crank and gear cases, but for valves, shafts, cylinder heads and jackets, supplanting a great deal of copper, iron and steel used before. The reason for the usefulness of aluminum is that the Germans have developed a number of very strong alloys, one of which is said closely to resemble the qualities of steel. The economic side of the matter is that the Germans mine coal belonging to France and to a considerable extent by French labor, and this coal enables them to manufacture tremendous quantities of aluminum cheaply by the electrical process.

This cheap production on a very large scale of coal has also aided the Germans to cope with their shortage of gasoline, as the gas obtained by distillation of the coal is used very largely to replace gasoline in stationary engines, marine engines, etc. This gas, which resembles liquefied or highly compressed illuminating gas in many respects, is transported in steel tanks from which it is drawn through suitable reduction valves. The reason for using this gas instead of industrial alcohol, which was used so widely in the early months of the war, is the necessity of economizing in potatoes, the chief staple food of the German people.

Rubber, the Germans say, will rapidly become a matter of the past after the war. All the tires used on German cars, as well as all the other rubber articles required by the Central Powers, are now made artificially, or rather synthetically. The Germans promise quite seriously that in the future their product will equal in quality and compete very successfully with Para and Ceylon rubber, and they never grow tired of repeating, with grim sarcasm, the fact that they are obliged to their enemies for forcing them to develop rapidly an invention which otherwise might have come along slowly in the course of years.

It has been stated previously that the Germans are organizing their industries more and more on the American, that is, the centralized, concentrated plan, and that by this means they intend to overcome whatever barriers they might have to break down in the market of the world when the war is over. This applies to the motor car industry as well, and in all likelihood, it will, after the war, face the world market as a solid combination, or "Kartell," as they call it in Germany—which is very little different from a trust. On the other hand, it is not at all impossible that the whole German motor car industry will devote itself to just one class of work, or chiefly so, namely, the building of trucks for agricultural and commercial uses.

Commercial Vehicles to Be Necessity

That the need for commercial motor vehicles will be even greater than for passenger cars, after the war, follows simply from the fact that the stock of horses, with the exception of the breeding specimens, will be practically killed off by the time the war is over. Besides, the farming population, and especially the smaller ground holder, will be very much dependent on government support in every form, and as the subsidy policy for motor trucks will doubtless be continued with even greater vigor than it was begun before the war, the incentive for buying efficient modern equipment will be correspondingly increased.

While the beginning of the war, or, let us say, the first 12 months, saw the introduction of many new devices and processes of warfare, such as movable siege guns, asphyxiating gases, liquid fire, electric barbed wire entanglements and so forth, the number of innovations in war technique since the end of the first year have been rather small. The reason for this is not quite easy to understand, but, as several officers of the engineering branch of the

German army have put it, is just about this:

"Germans, Austrians, French, and, in spite of their denials, British, have for years preceding the war invested an immense quantity of study and labor in the possibilities of the present war, and according to their ideas of the problems it would present, have worked out different schemes to overcome the difficulties they assumed they would have to face. Consequently, as the different ideas of warfare were given reality by the war's first year, the different inventions and discoveries and methods, either perfect or made so during that period, were brought into action. This introductory period being past, and the gravity of the struggle centering upon the western field, methods had to conform to the situation given there. What is this situation? You may liken it to a game of chess on an immense scale, a game in which each player, according to known ways of playing, is capable of checkmating his opponent at the latter's first grave mistake. Hence the endless feeling-out and experimenting on both sides. Now and then, one or the other player believes he has found a new solution, but upon attempting to put it into practice sooner or later finds he has not gauged the situation correctly. It is simply the impossibility of solving a problem of strategy by tactics."

These words are almost verbatim what the writer learned from a high "genie" officer, now retired because of injuries. The interview took place in September, and the writer having obtained some English papers in Holland a few days before, asked the colonel above quoted: "How about the new British 'tanks'?"

The British Tanks

The officer stroked his long mustache and answered slowly: "It is quite a novel development, and its full efficacy cannot as yet be approximated, but if you want my opinion of the 'tanks,' let me tell you that on the western front, two things count, men and explosives. Other devices are entirely minor. The men being required to serve the machinery of war, the rest consists in blasting to bits as much as possible of the enemy's position. Whatever is not an explosive is subject to destruction by explosives; and all we can tell after a few days' experiences, so to speak, with the 'tanks,' is that this maxim holds good in their case. They move slowly, at hardly more than 5 miles an hour, and that makes them splendid artillery targets."

I requested a description of the "tanks" from the colonel.

"Mind you, this is far from being exact. Well, they are about 65 feet long, almost 10 feet high and not much narrower. The most striking feature is propulsion by endless steel lattices, engaged in the manner of chains by a set of driving wheels arranged on each of the axles. Steering is by a central pair of wheels placed like that of the old-time tricycles and arranged back of the machine. The powerplant is situated close to this third wheel, entirely out of view from in front, and I conclude that the driver is guided by a sort of periscope eye placed in a well-shielded position at the front of the machine. I doubt whether this engine weighs less than a 4:4:2 type of locomotive, and therefore would easily require 400 to 600 horsepower for driving it. I know that allied journals state the machine is like a railroad engine and carries its own rails along. But this is not so. These rails are continually being laid over the most torn up ground imaginable, and the simile would be more correct if they would say that traction is by means of a pair of wheels, one on each side, with a theoretical spoke length of several hundred feet, but so actuated as to overcome the difficulty which this radius would cause if power were applied at the geometric center of the wheel. We have not as yet captured a 'tank,' chiefly because when—as it happened in several cases—a 'tank' gets beyond control, it is blown to smithereens by the army of which it is part, so as to keep us from capturing it. Hence, you understand, all these statements are, so far as the construction is concerned, a matter of deduction. I should not be surprised, however, if these huge machines were driven, instead of by gasoline motors, by Diesel engines. By the way, isn't there a similar tractor made in the States?"

I failed to recall at the moment. The colonel gave me a merry look, like a schoolboy finding that there is one thing he knows and the teacher does not; and opened a drawer of his office desk. After a few seconds he handed to me a catalog of the Holt tractor factory! There was an illustration of what no doubt served as the original type for the "tanks," the caterpillar drive used on an American agricultural tractor.

The privates, "Kanenenfutter," who return from the trenches for a brief furlough to the "hinterland," are less easy about the new fighting machines. They maintain that when the "tanks" were first introduced, they made quite a terrible impression on the soldiers in the trenches, and it took quite a while until the suitable artillery could be got into readiness. But now the "tanks" are said to be a normal feature of the fighting, like poisonous gases, and the soldiers, with their marvelous faith in the ability of the army's rank, feel certain that very shortly their effects will be quite checked and possibly beaten by a counter-invention. But there, the words of the engineering officer will probably prove true.

A remarkable feature of the situation at present is the feeling toward America. The antagonistic sentiment which existed about a year ago has very much subsided, and the ideas then prevalent, about "révanche" toward America, for supplying the enemy with ammunition and for restricting the submarine warfare, have almost disappeared, and by the intelligent Germans are passed over with a slight embarrassment. When you ask them about it, they say that they are so certain of their success in the end, that they will need their energies for something else than hitting back, after the war, at who might have harmed them during the war. The fact is, they realize that they will need very much raw material when the seas are open once more, and that it is no use antagonizing the people from whom you will have to buy most of it and who will find customers aplenty.

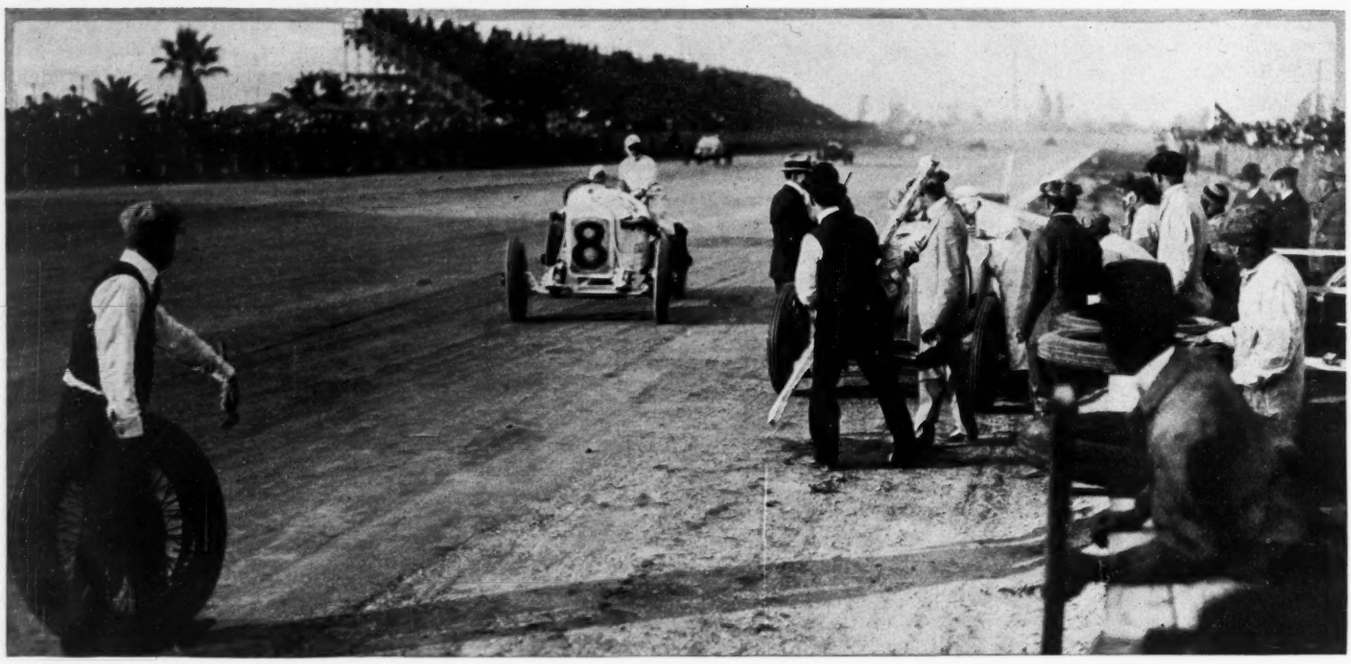
Of course, trade, like everything else, will be very different after the war. New methods will have to be used, both in buying and selling, and especially will the matter of credit and payment be altered. After the war, especially where such articles as motor cars, and particularly trucks, are concerned, a considerable part, if not most of the business, will be done on a basis of installment payments from the consumer. In other words, American exporters here will meet a similar condition to that prevailing in South America, where payments are on long terms. It is not improbable that the same condition will apply to all of Europe, at least the Continent; and hence, exporting will call for more capital than it did before the war. Add to this the likelihood that every one of the European States or groups of States will surround itself by a tariff wall, and it follows that business with Europe after the war will be big, and although big, yet not an easy matter to transact.

Advises Looking to Future

It would be well for the American car manufacturer who is at present reaping handsome profits to look into the future, organize his plant in the most efficient and economical manner imaginable, study the past methods required in trading with different European countries and educate their working, selling and advertising forces with a view to taking up the hard work of exporting when the opportunity presents itself. In this regard, the parable of the wise and foolish virgins will once more prove significant.

In closing, the writer would like to add one more thing which, though not of immediate motor car nature, should make American manufacturers think. American business men, not only in Germany and Austria, but also in Holland, Switzerland and Scandinavia are continually bemoaning the fact that there is so little of an American merchant marine with ships plying between the old and new world. They fail to see why their business, often enough in merchandise which cannot in any way be construed to be contraband, should be paralyzed and, as it was in many cases, destroyed, because nations other than their own are at war, and things seem to have come to the point where the belligerents force neutrals to look out for everyone's interest except their own.

Ascot Race Goes to Rickenbacher



Cooper coming into pits for tires. The car stationed at the pits is Weightman's Duesenbarg

Cooper Paid Second Money Which Pullen Won?

Driver	Car	Time	Average	Purse
Rickenbacher	Duesenberg	2:13:15	67.54	$3,000
Cooper	Stutz	2:14:29	66.92	1,250
Pullen	Mercer	2:15:3	66.65	500
Ruckstell	Mercer	Flagged in 145th lap	....	250

LOS ANGELES, Cal., Nov. 30—For genuine enthusiasm and rousing interest on the part of the spectators, it is doubtful if any motor race of the season created as much excitement as the running of the 150-mile championship award sweepstake on Ascot Park speedway today. Eddie Rickenbacher won, driving a Duesenberg, in 2 hr., 13 min. and 15 sec., an average of 67.54 miles an hour, which bettered his own record of 67.1 miles an hour made in a 100-mile race on the Providence speedway. Earl Cooper coasted into second place in a Stutz with his gasoline tank drained dry and Eddie Pullen finished third in a Mercer after leading the field for 110 miles. Grover Ruckstell was flagged because of approaching darkness in fourth place with 5 miles yet to go.

Preceding the start of the race, Resta was awarded the American Automobile Association championship and the Goodrich prize, which increases his monetary winnings this year by the extent of $5,000. He was called from the grandstand to the middle of the track and while a battery of motion picture cameras played on the scene, Manager Frank Carroll, of the local branch of the B. F. Goodrich company, presented him with an immense floral offering. The action did not evoke as much as a ripple of applause from the multitude and he returned to his seat beside his wife without one tiny cheer being uttered. California race fans are not so much for the winner as the man who tries. Had it been Rickenbacher, Cooper or Pullen to receive the crown cheers would have re-echoed from the snow-capped mountains.

The Ascot speedway demands the best there is in a driver every minute. After his victory, Rickenbacher made the following statement: "Driving the Ascot track is genuine work. There is not one moment of rest. That is the reason it tests the ability of drivers more than the large eastern speedways." It is impossible to make as fast time as over the board courses, but the crowd never thinks about the speed. They don't care whether it is 50 miles an hour or 25. They know it takes masterly driving and the spirit of competition makes the thrills.

FULLEN MAY BE SECOND

Los Angeles, Cal., Dec. 2—Special telegram — A recheck by scorers shows that Pullen finished second in the Ascot race but the discovery was made too late for protest under the A. A. A. rules, which allow only 24 hrs. for filing protest. An effort probably will be made to alter the records, but hardly can be substantiated. Official timers' check and Cooper's pit check place him second and check on which the protest movement is based was kept by adding machine operators and not by timers. Cooper has been paid second place money but says he is disposed to do what is right if shown he is not entitled to second place and money.

It was estimated by the management the attendance was 30,000. Bleachers with seating capacity for 7,000 were packed. There was another 5,000 in the grandstand and cars and spectators on foot lined the entire track, piled on to the roof of a barn that remains from the days when Ascot was devoted to the ponies and sought every point of vantage the police would let them occupy. The policing of the course was perfect.

The California racing crowd likes the excitement incident to seeing a car come into the pits. If such a thing were possible, its appetite was satisfied. The Ascot surface is admittedly hard on tires and regular attendants at contests there have learned to approximate about when a car must stop for new shoes. At the first sign of the red danger strip, they begin to push forward and hundreds of watches are jerked from pockets as there is as much rivalry in making quick tire changes as there is in the running of the race. Thirty-two pit stops were made by the twelve contenders and fifty-four tires were changed. It was a

great treat to see Cooper's helpers replace a right front wheel in 30 sec., and later change three wheels in 1 min. and 10 sec. Pullen changed all four wheels, lifted his hood and examined the spark plugs in 1 min. 15 sec. Rickenbacher made one complete tire change, four wheels, in 54 sec. and another in 50 sec.

In the sixtieth lap, Rickenbacher shoved his white Duesenberg up to within 25 feet of Pullen's rear and held it there until in the ninety-ninth lap, when, on the south turn he blew a right front tire. His car lurched, but he held it down beautifully and limped seven-eighths of a mile on the rim. Resuming the grind, Rick opened up and by the 110th lap was second, having passed Cooper. In the next lap, Pullen had to stop for tires and Rickenbacher took the lead never to be headed again.

After driving 120 miles in great style, Pullen seemed to be in trouble. Observers thought he was tiring under the strain, but his mechanic signaled something was wrong under the hood. In the 124th mile Cooper passed him and in the 133rd he motioned to Toft to go on around him when on a turn. Three laps farther and Rickenbacher had lapped him, and ten miles from the finish Cooper was leading him by a mile, so it was evident his race was run.

Cooper and Rickenbacher were in the same lap 5 miles from the end and the Stutz pilot began letting his car out. When Rick got the green flag he was half a mile to the good. Crossing the tape for the next to last time, Cooper's car shot fire through the exhaust pipe. There were a number of sharp explosions. "Cooper's coo-cooed," somebody cried, and Pullen, a mile behind, was coming fast once more. Earl kicked his throttle far enough to get high on the turn and drifted down the back stretch. He shot the last remaining drop of gasoline coming out of the last turn and with his tank dry coasted over the line, stopping with his rear wheels exactly on the marker. His car had to be pushed back to the pit. Another minute and he would have been out of the race instead of winner of second place. It was the most spectacular finish ever seen on a local course. Pullen tried hard but could not get 2 miles out of the Mercer under full power while Cooper's Stutz was coasting 1.

Hughie Hughes

HUGHIE HUGHES was a native of the tight little isle where they drop their h's. He was one of the best known race drivers the world has seen and was one of the old school, of which few are left to-day. Two continents have seen him at his best. In 1904 he drove a De Detrich in the Gordon-Bennett race and in 1911 won the Savannah trophy race in a Mercer.

Hughes drove in a number of 24-hour events and hillclimbs for the Allen-Kingston Co., selecting the same make of car for his debut as did de Palma. He joined the Falcar team in 1910, taking third place in the Savannah cup race, which was a curtain raiser for the Grand Prize event. In 1911 he headed the Mercer team and became nationally famous, taking 231-300-cu. in. events at Elgin, Savannah, and Fairmount park. He piloted the Mercer again in 1912, and was third at Indianapolis, second to de Palma in the Vanderbilt at Milwaukee, and won the Aurora cup at Elgin.

Nineteen-thirteen saw Hughes in only two races, both at Tacoma, where he piloted a Tulsa. In 1914 he won the Potlatch trophy at Tacoma in a Maxwell, and in the following winter drove an Ono into third place in the Grand Prize at San Francisco, and then signed up with Finley R. Porter to drive one of the F. R. P. cars, but these were in the shop most of the time and did not enter any contests.

He started the present season with a twelve-cylinder Sunbeam on the coast, but had little success with it. He drove one of the Harkness Dillages in Omaha, but did not finish, and he attempted to scale Pike's Peak in the August climb in a Duesenberg, but went out before reaching the top.

Hughes and Galvin Toll of Uniontown

UNIONTOWN, Pa., Dec. 4—The finger of death drew the curtain on 1916 racing Saturday in the inauguration of Uniontown's new 1⅛-mile board track, claiming Hughie Hughes, one of the romantic figures of the American motor car racing, Gaston Weigle, mechanic for Frank Galvin, and today Galvin died of his injuries. These fatalities, which occurred during the running of the Universal trophy race that opened Uniontown's speedway and practically closed the season, overshadowed the performance of those who placed in he race.

Louis Chevrolet piloted his Frontenac across the tape and won the 112-mile race in 1:14:12.4, this, by the way, being the first race in which Frontenac has finished this year. Dave Lewis was second, Ralph de Palma third, Barned Newgard fourth, and Milt McBride fifth.

The accident that took the lives of Hughes, Weigle and Galvin, and which may prove fatal to one spectator, occurred in the sixty-second lap. Hughes had run his car into the guard rail some distance down the track from the starting line and had walked to the press stand. Galvin lost control of his car and it shot toward the stand, which Hughes had reached scarcely a moment before. Galvin's mount crashed through the stand and although Hughes saw his danger, he had no opportunity to escape.

Twelve other persons, among whom were J. E. Hoskins, of Chicago, owner of the Hoskins car, which Hughes was driving in the race, were more or less seriously injured in the crash.

Frank Galvin

FRANK GALVIN was born in Dublin, famous for the rocky road that leads to it, and gained most of his fame in the land of the Kaiser, where his prowess as a bicycle rider won him many dollars 10 years ago. His first appearance as a race driver in this country was in 1913, when he campaigned the Buick Bug on eastern dirt tracks and won 61 firsts in short-distance meets and acknowledged supremacy to only one pilot that he met—Ralph de Palma.

He drove in Germany before coming to America, and in 1912 scored the most notable achievement of his racing career, running second in Lautenschlager, twice winner of the French Grand Prix, in the Hamburg-Berlin road race in which his Opel finished only 14 seconds behind the Mercedes.

He began the 1915 season as Resta's teammate, starting a Peugeot in the Indianapolis classic, but turned over during the race and sustained injuries which incapacitated him for the rest of the season. He figured in a similar accident this year, when, after taking fifth money in the Chicago Derby, his car ran wild and left the track, although neither he nor his mechanic was injured. In the speedway Grand Prize at Chicago this year he won the second heat and finished fourth in the finals and took third money at Cincinnati.

Galvin was more successful as a bicycle rider than as a race driver. He held the world's paced record of 1:02:04 for 100 kilometers, and at the height of his pedaling won four 6-day races and placed in forty-one of sixty-eight starts. He won the richest purse ever hung up for a bicycle race—$32,000 at Sydney in 1906.

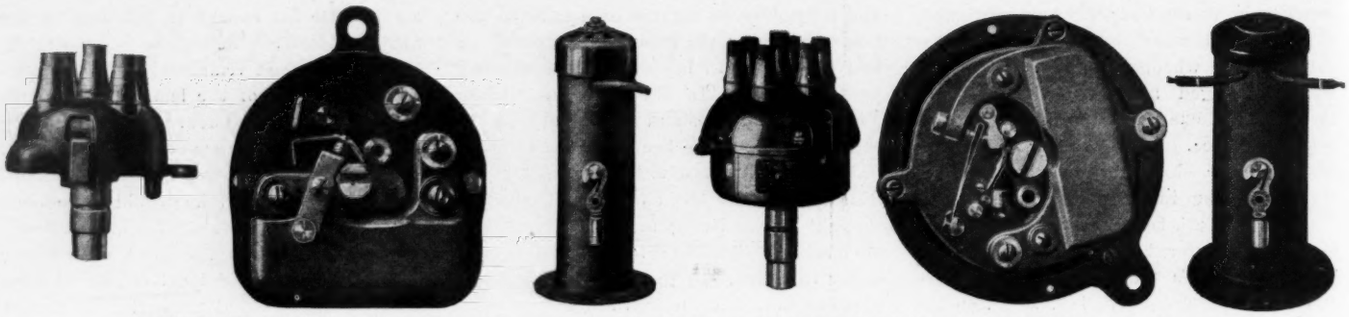


Fig. 1—The first three illustrations show the new Atwater-Kent closed-circuit distributer, side and top view, and the coil which is used with it. The next three views show similar parts of the improved open-circuit type

A Hot Spark at High Motor Speeds

New Battery-Generator Ignition Systems Tend to Eliminate Mechanical and Electrical Lag

THE battery-generator system of ignition is stepping into its sixth year of application to motor cars with improvements centering around simplification of all mechanism, easier adjustment of contact points, greater spark intensity brought about by provisions for complete saturation of the coils, careful machining and balance of all parts to prevent harmonic vibration, and withal a refined assembly to make an oil,- water- and heat-proof unit.

Open and closed circuits are evident in a variety of forms with arguments favoring the former based on its smaller current consumption, and on the latter on its simplicity. Most breaker mechanisms are spring-operated, although one of the improved systems handles the opening and closing of the circuit by mechanical means.

Of course one of the supporting arguments in favor of the battery system of ignition has been its adaptability for producing a hot spark at slow motor speeds. The present tendency is to maintain this hot spark with a less acute downward turn of the curve as the engine speed increases, and in recently introduced systems, described on the following pages, the curve is maintained practically on a straight line at all speeds.

In the conventional types, this greater spark intensity at higher speeds is being brought out by lightness of parts to reduce mechanical lag and maximum saturation in the primary coil to prevent electrical lag. In the constant-intensity systems previously mentioned, it is the claim that electrical lag is entirely done away with because of the fact that the duration of the breaker contact is sufficient to permit maximum saturation.

ATWATER KENT

The Atwater Kent Mfg. Works, Philadelphia, in addition to a refinement of the open-circuit system it has been manufacturing now offers a closed-circuit type with an extremely simple, light and compact timer-distributor mechanism with the condenser in unit.

Fig. 2—The Philbrin ignition head, showing method of connecting terminals

The type CC system of the closed-circuit type is mechanically a device of few parts. The contact arm is lighter than has previously been found possible and this lightness is said to eliminate harmonic vibration, reduce wear and increase the spark at high speeds. The short contact arm engages the cam at the end instead of the middle with a consequent increase of synchronism and reduction of inertia. The adjustment of the contact points has been simplified to the point that the setting may be made with the fingers or a screw driver, and the adjusting screw is on top and facing upward where it is easy to get at.

What appears to be a vital improvement

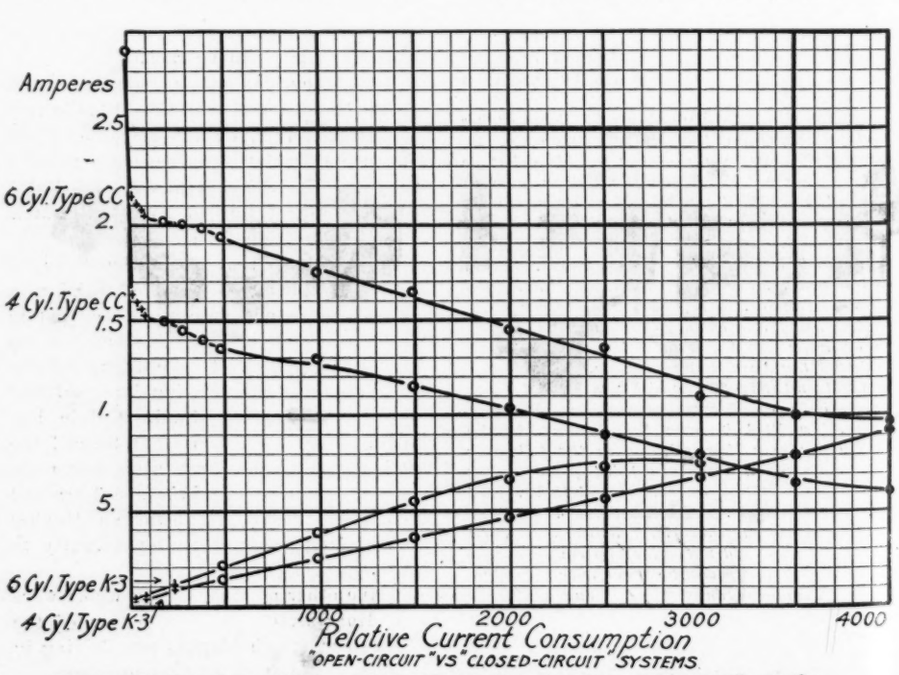


Fig. 3—Chart to show relative current consumption at various motor speeds of the Atwater-Kent type CC closed-circuit and type K-3 open-circuit distributers

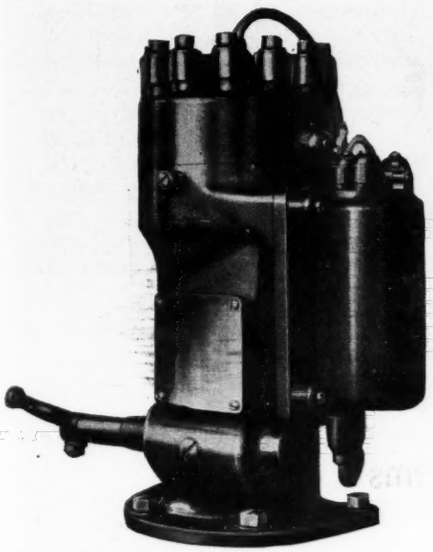


Fig. 4—Philbrin twelve-cylinder distributer unit. Note the inspection plate on the side

Fig. 5—Three views of the Remy twelve-cylinder distributer. This is one of the most simple of the closed-circuit types

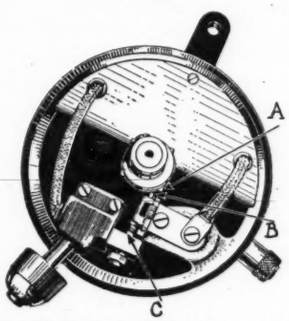


Fig. 6—Philbrin contact maker. A is the cam, B the plunger and C the contact points

in this type of distributor is the mounting of the condenser. It is placed directly on the contact maker instead of on the coil. This permits more efficient arc absorption, less wiring and shorter wires and, naturally, a simplified coil. This new condenser is applied both to the type CC and the improved open-circuit type known as the K-3. Tests have convinced the makers that to function properly a condenser must be as near the contact points as possible, that is, the greater the distance between the point at which the circuit is interrupted and the condenser, the bigger must be the condenser itself. By locating the condenser directly at the contact points it was found that one which would perform the same amount of work as the previous model could be made in one-sixth the size. The new condenser is oil and water proof and may be readily removed.

The shaft and cam of the type CC is built up from one piece of Bessemer steel. The diameter is small, reducing surface velocity, which feature has much bearing on the flexible operation of the contact arm at high speed. As shown by the curve printed in Fig. 3 the closed circuit type consumes more current than the open circuit. This is due to the greater contact time. In the type CC the contacts are together for a considerable period while in the open circuit the break is a matter of hundredths of a second.

The coils used in both systems are similar except that the coil in the closed-circuit system includes a series resistance for protection at very low speeds or in

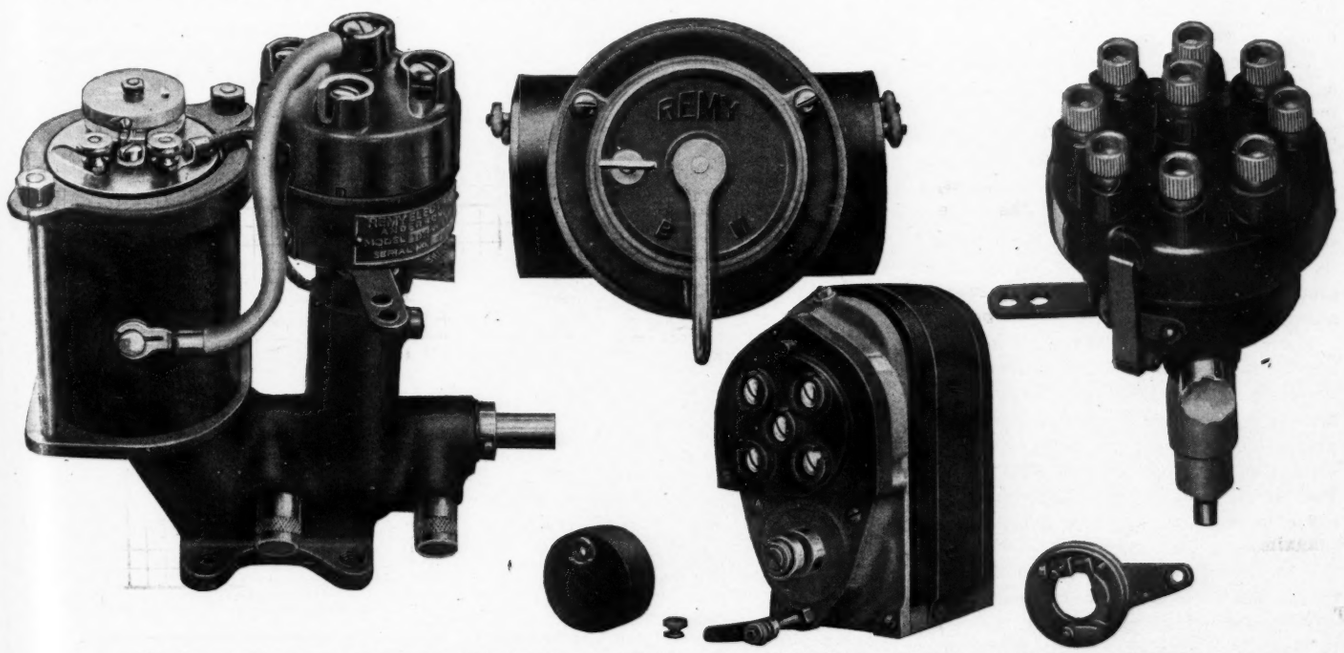


Fig. 7—An assortment of Remy ignition units. A distributer and coil mounting is shown on the left, a coil and switch combination in the top center, the eight-cylinder distributer on the right, and in the bottom center the Remy magneto with breaker box removed

Fig. 8—Westinghouse vertical ignition unit for eight-cylinder motors, mounted on round-frame lighting generator

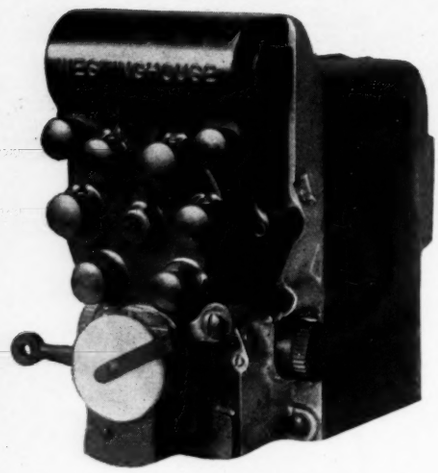


Fig. 9—Westinghouse lighting and ignition generator with non-automatic spark control

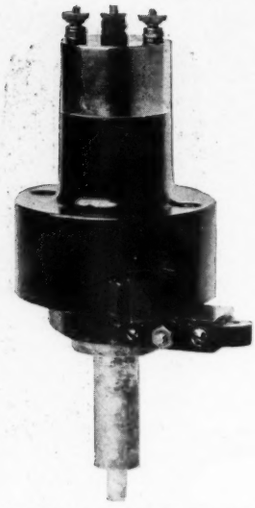


Fig. 10—The simple and unusually lightweight Pittsfield distributer

case the switch should be left closed with the motor stopped. This instrument is made in four and eight-cylinder types.

The only material change in the type K-3 is the new location of the condenser, previously described. The outstanding feature of this instrument is it mechanical operation and the fact that there is a constant current flow through the primary winding regardless of speed. This gives a spark of very nearly equal intensity at all motor speeds.

CONNECTICUT

Simplification of the fundamental principles of the igniter of the Connecticut Telephone and Electric Co., Meriden, Conn., has brought out a new instrument in which the advance mechanism is completely inclosed and there are no moving wires. An entirely new casing construction permits very ready repair and removal of the contact points, as the breaker mechanism can be entirely removed by taking out two screws.

This breaker mechanism is situated on a plate which is mounted within the casing and is fastened by a solid and a spring ring. The solid ring, in turn, is held in place by the two screws, by the removal of which the entire assembly can be removed. The spark advance lever operated in a stud in the breaker plate and the plate and its conjunctive mechanism is advanced around to shaft to set the ignition timing ahead.

There has been no change made in the mechanism of the breaker itself. As the system is of the closed-circuit type, it has been so designed as to allow the maximum amount of contact to permit complete saturation of the coil at high motor speeds. The simple breaker and light parts minimize mechanical lag, and together with the principle of completely saturating of the coil the spark will be properly timed to the plugs regardless of motor speed.

The thermostatic principle of protection is retained. This thermostat, which may be set to act from 30 sec. to 4 min., and if the current is left on the heat therefrom bends the thermostat in the time it is set for and automatically closes the switch.

There is a change in the design of the distributor housing. A spark gap takes the place of the wiping contact previously used. This minimizes wear. The rubber is drilled with tiny holes to prevent oxidization and permit ventilation of the interior.

PHILBRIN

The new Philbrin system of ignition was described in the October 26 issue of Motor Age immediately following its introduction. It is both a single-spark and continuous spark system, where either type may be used at will, there being models for four, six, eight and twelve-cylinder motors.

The unusual feature is the breaker, which furnishes spark of a fixed intensity at all motor speeds. The cam is a series of small triggers. When the cam is rotated the arms are pushed out, closing the contacts. When the trigger passes the arm the contacts are separated by a spring. If the cam is rotated the wrong way by a back explosion there is a trigger that pushes the arm out of the way, thus eliminating danger of damage to the mechanism. This is the single-spark system. The contact points are brought together gradually by the surface formation of the cam, and when the point of ample saturation of the coil is reached the breaking of the contacts is instantaneous. No matter how fast spark system, but the circuits are septhe motor is revolving the contact maker has ample capacity.

The high-frequency system uses the same coil and distributor as the single-spark system, but the circuits are separate. It has its own condenser and interrupter. This interrupter supplies a continuous flow of sparks and current is supplied to it through a polarity reverser which reverses the direction of the current flow each time the switch button is turned, equalizing wear on the contact points. Because of the shape of the distributor blade, which, incidentally, is common to both systems, there is an overlapping of sparks after the explosive spark has been delivered to a cylinder, thus creating what might be termed a flame of spark until the forward edge of the distributor blade connects with the distributing point of the next cylinder. The first spark is followed by the follow-up sparks at intervals of

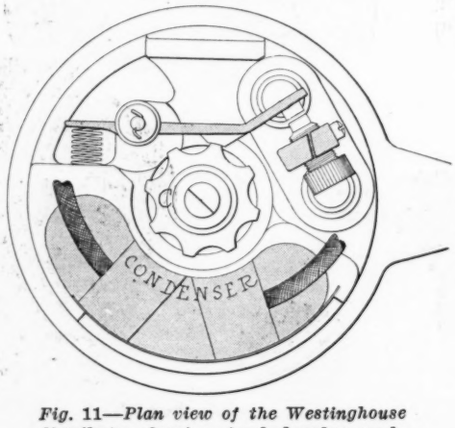


Fig. 11—Plan view of the Westinghouse distributer showing simple breaker mechanism. The condenser is built into the distributer

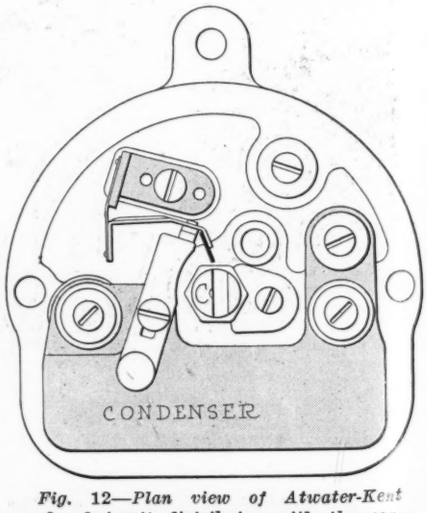


Fig. 12—Plan view of Atwater-Kent closed-circuit distributer with the condenser as a unit

approximately 1-100 sec. and these latter sparks are synchronous. The follow-up system has its part in cold weather starting, poor gasoline, or foul spark plugs, and in keeping the plugs clean without harming the electrodes.

The Philbrin duplex switch takes care of the two sources of current, a lever being applied by which either may be thrown on. This system is a product of the Philips-Brinton Co., Kenneth Square, Pa.

DELCO

There has been no material change in the Delco system of ignition, made by the Dayton Engineering Laboratories Co., Dayton, Ohio. It is provided with both automatic and manual control. A single spark is obtained each time the breaker contacts open, it being of the closed-circuit type. The distributer is vertically mounted and carries the automatic advance mechanism, the breaker cam and the rotor. A rotor button is contained within the arm and is held against the distributer head by means of a small coil spring. This rotor makes a wiping contact with the contacts in the distributer head.

BOSCH

The Bosch battery system of ignition is continued with but very few minor alterations over the system of 10 years ago. The principle used is the closed circuit, and the complete system has a combined timer and distributer and a combined switch and coil. The breaker mechanism and distributer are extremely simple. In the former the cam rotation presses a fiber block which closes the contacts, these contacts being pulled apart by a spring.

PITTSFIELD

In the Pittsfield battery ignition system the contacts are mechanically closed and opened, springs being entirely eliminated. This is a product of the Pittsfield Spark Coil Co., Pittsfield, Mass. The breaker, coil and distributer are all in one unit and are built in models for four, six, and twelve-cylinder motors.

Being an open-circuit system, the contacts are normally separated. The cam rotation presses the arm carrying the lower contact, bringing the contacts together. As rotation progresses the cam brings this

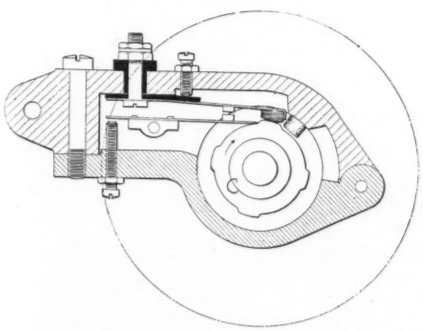


Fig. 16—Pittsfield distributer in which the contacts may be adjusted by turning the small screw which bears against the cam-controlled lever

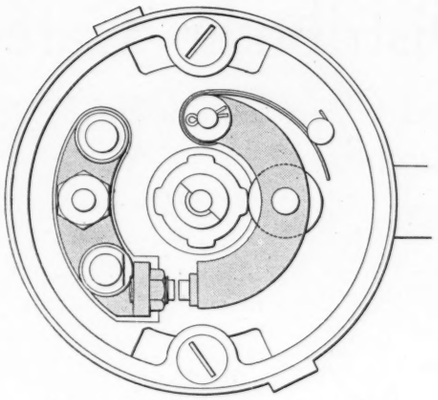


Fig. 13—Showing the simple operating mechanism of the Connecticut timer. The adjustable contact screw is easily reached

arm in contact with a fiber member on the end of the arm carrying the second contact, thus breaking the circuit.

The contacts remain together for the maximum length of time to afford complete saturation of the coil at high motor speeds. Because of the instantaneous separation of the contacts mechanical lag is minimized.

REMY

There is no change of moment in the ignition equipment of the Remy Electric Co., Anderson, Ind. In the Remy dis-

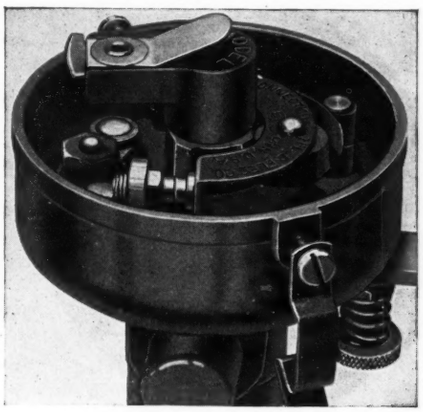
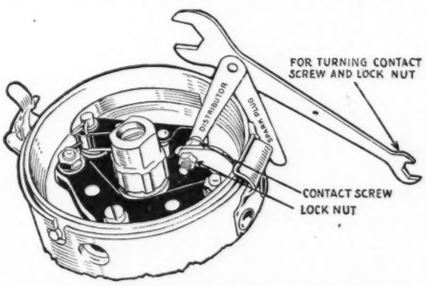


Fig. 15—Connecticut distributer with cover removed. This is the hand-controlled type

tributer the circuit breaker is combined with the distributer proper in a mechanical unit. The ignition mechanism is operated by a center shaft extending down



Feb. 17—Method of using gage in adjusting contact points of Delco distributer

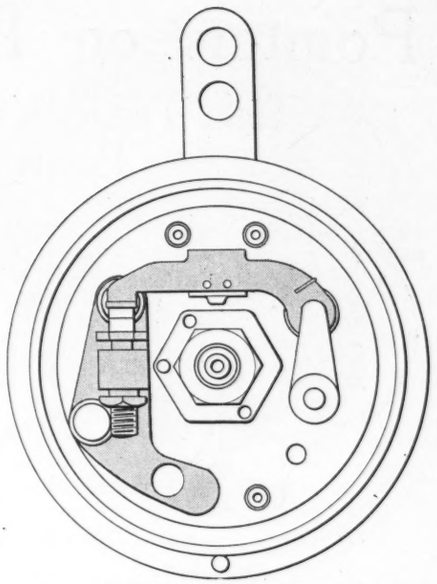


Fig. 14—The simple Remy distributer showing method of adjusting contact points

through the elongated portion of the case which forms a long bearing for the shaft as well as a means of mounting the distributer on the motor. The Remy circuit-breaker mechanism, which is combined with the distributer, is readily accessible for inspection of the working parts by removing the top cap. The circuit breaker is composed of two contact points, one of which is stationary, while the other one is mounted in the free end of a pivoted arm. A spring presses against the arm, tending to hold the two contact points together, but the arm is forced out by the rotation of the cam, the rounded corners of which strike against the block of hard fibre riveted in the circuit-breaker arm. This gives a combination of rubbing surfaces which is very durable. The number of moving parts of this circuit breaker is two, the pivoted arm and the rotating cam.

The distributors may be had in styles for four, six, eight and twelve-cylinder motors with provision for advancing and retarding the spark by means of a movable plate in an automatic or semi-automatic types of control.

There has been a slight change in the coil, appearing in the method of binding the high-tension end of the winding.

WESTINGHOUSE

The Westinghouse system of ignition brought out by the Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa., is a closed circuit type with the timer, distributer and coil in one unit. Types are made for four, six and eight-cylinder motors.

The timer-distributer is mounted vertically and operated through the cam or magneto shaft. In operation rotation of the cam brings the breaker contacts together, being separated by a small coil spring. The cam is mounted loose on the

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Pointers on Distributer Care

Tight Terminals and Clean Contact Points Essential

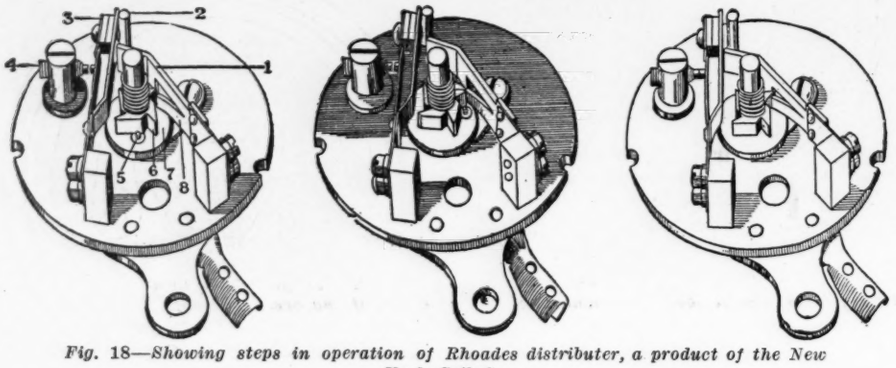

Fig. 18—Showing steps in operation of Rhoades distributer, a product of the New York Coil Co.

IT IS a fortunate thing for the car owner that the present-day system of battery ignition is perfected beyond the everlastingly troublesome stage. Reluctance of the amateur repairman to touch anything electrical is proverbial and there is probably nothing more mystifying than a defective distributer, despite its simplicity.

There is really nothing to look out for unless in unusual cases in a battery system of ignition, except tight terminals and properly cleaned and adjusted contact points. The matter of cleaning and oiling should become a habit and every car owner should know just how to go about it to clean the contact points—not waiting until they suddenly cease to function, which they will do sometimes, before he thrashes out the directions from his instruction books.

The matter of simple adjustment has been given a great deal of attention recently by the makers. It is really a simple proposition of closing the points by screwing up one of them or by removing small adjusting shims from in back of the head of the screw which carries the platinum point.

Cleaning platinums is an operation which should be carefully performed. Haste is not profitable. If they are not too badly pitted they may be flattened and smoothed with a very fine file or with emery cloth. If they have become badly out of shape they may sometimes be pounded back with a hammer. Care should be taken when this is attempted that they be pounded to a flat surface. Remember that the platinums must fit flat against each other throughout their surface. An uneven surface will cause arcing with consequent pitting of the platinums.

In a type such as the Delco the distributer head should be wiped out with a rag soaked in kerosene about once a month. If it is noticed that the contact points in the heads are blackened it may be assumed that the rotor button is not properly lubricated or that the tension of the small spring under it is too great. In cleaning the rotor track emery paper only should be used, and this of the finest grade. Sandpaper is tabboo.

The rotor should be periodically examined. It must slide freely in its socket and its surface must be clean and bright. The cleaning process should be done with fine emery cloth with a finishing polish done with leather. The gap at the contact points should be .018 inches. The method of adjusting the Delco contact points with the special wrench and gage provided for the purpose is shown in Fig. 17. The lock nut should be loosened up with the wrench and the contact screw turned up against the gage. Upon leaving the factory these distributers are packed with a soft cup grease sufficient to last a season. This may be replenished by removing the ignition coil mounting plate.

The matter of timing is the same in practically all systems. In short, the points of each cylinder in the distributer should be so set that they will break at the moment the piston in that cylinder starts to descend from top center.

Remy Timing

In the Remy distributers the engine should be turned over until No. 1 piston reaches top center. Press in on the timing button at the top of the distributer and turn the armature shaft until the plunger of the timing button is felt to drop into the recess in the distributing gear. With the generator in this position it should be coupled to the motor. There is no need of paying attention to the circuit breaker, as it is automatically located.

The breaker points in the Remy system should be set .020 to .025 apart, and the rebound spring should be at least .020 inch apart. One should provide himself with a gage for measuring these gaps. There is an oiler directly under the distributer head which should be kept filled with a

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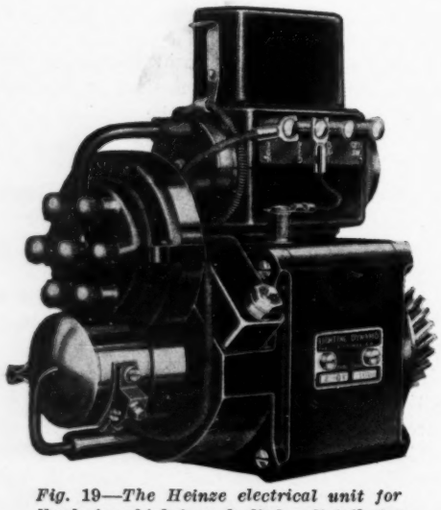


Fig. 19—The Heinze electrical unit for Fords in which is embodied a distributer for ignition

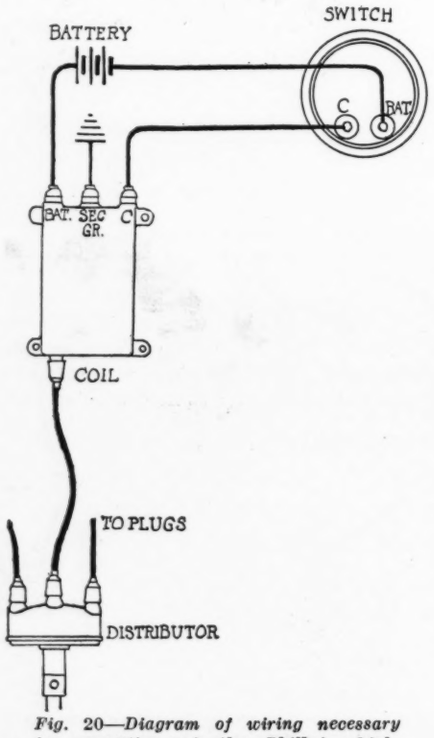


Fig. 20—Diagram of wiring necessary for operation of the Philbrin high-frequency and single-spark unit

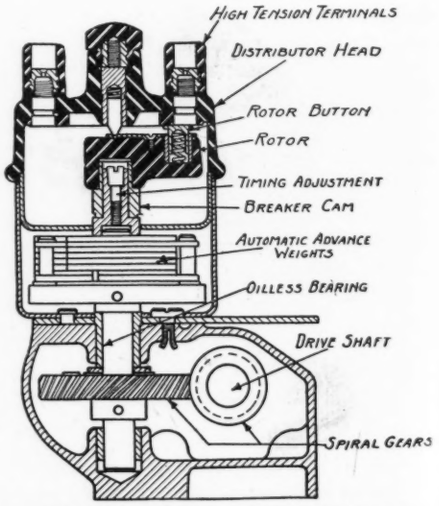


Fig. 21—Section of Delco distributer with names of principal parts

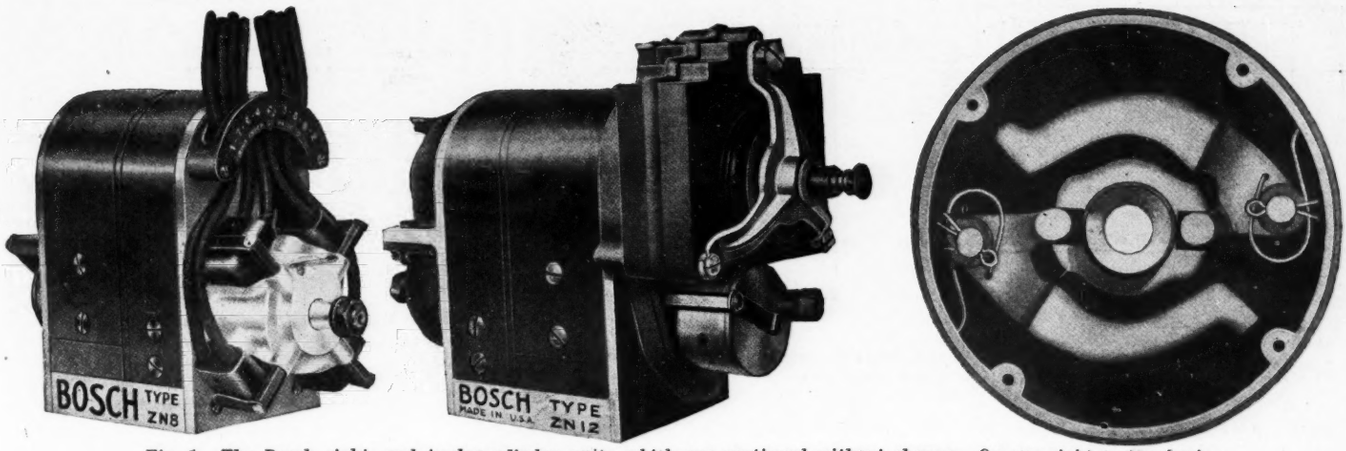


Fig. 1—The Bosch eight- and twelve-cylinder units which are continued without change. On the right is the Levison spark controller, which consists of a centrifugal governor mounted on the drive end of the armature shaft

Magneto Makers Face Material Shortage

Scarcity of Raw Materials Hinders Production—Mechanical Changes Are Evident in Only Few Cases

MAGNETOS have gone a year without any general changes of major character, what alterations that appear being matters of minor improvement here and there to develop the already nearly perfect machines. It is the manufacturing rather than the development end in which the magneto makers have concentrated their efforts.

It might be supposed that the increasing preference of battery ignition for use in pleasure cars would have created a serious inroad in the magneto business, but such is not the case. The tremendously increased truck business is taking a big supply of these instruments. Magnetos have a big following abroad and the war has cut the domestic supply and made necessary development of materials at home.

The effect of the war in the magneto business was to cut off the supply of magnet steel which, until the war developed, was an imported product. American steel makers have come to the rescue with a very commendable grade of magnet steel, although the magneto manufacturers were handicapped and still are to obtain sufficient quantities of raw material.

BOSCH

Bosch has not considered the development of new models in the past year, in fact there have been no changes in the Bosch principles of construction for a good many years. This maker was one of the first to use the high-tension magneto with both windings on the armature and also to develop a successful double-ignition system whereby a battery could be used to advantage through the distributer of the magneto. Models are made in a great many types to fit all kinds of motors and the biggest production is concentrated on the water-proof types, which are built for all types of motors.

DIXIE

The Splitdorf Electric Co., Newark, N. J., is offering its Dixie magneto with a few small mechanical changes, the most important of which is the arrangement of the lubricating channels which allow just enough oil to lubricate the cam without allowing an accumulation of excess lubricant. If the magneto becomes overoiled from the motor it is drained off through overflow passages. The Dixie is representative of the wireless armature type. The magnets are placed at right angles instead of parallel to the rotative axis.

Current through the windings is created by two pieces of soft iron, one with a north magnetism and the other with a south

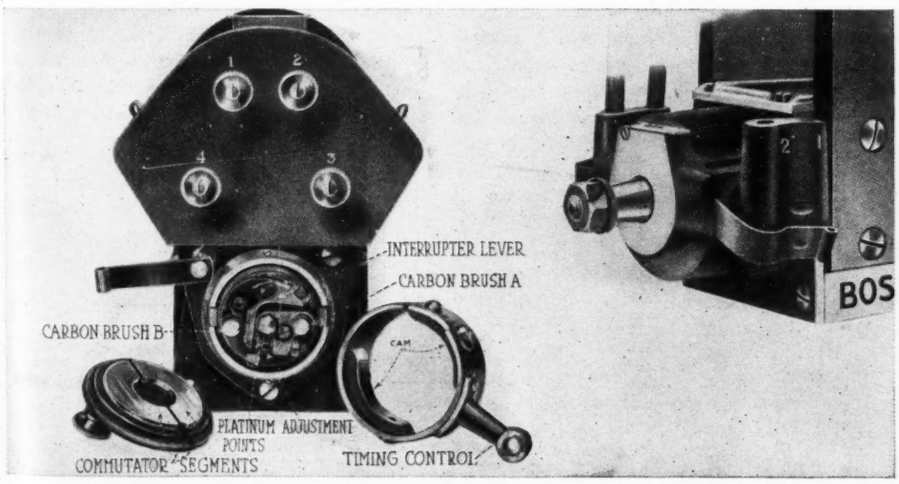


Fig. 2—Showing parts of breaker mechanism and timing control of one of the Bosch four-cylinder types

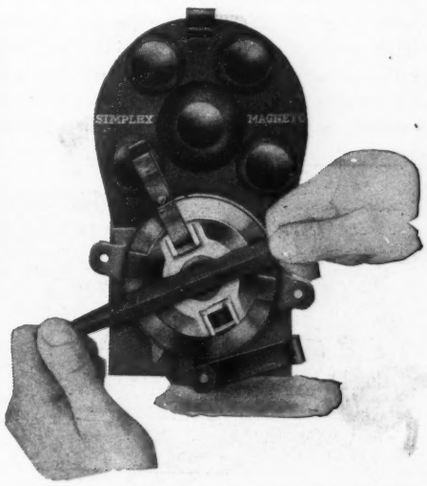


Fig. 3—Method of dressing down the platinum point in the Simplex magneto with the use of a fine file

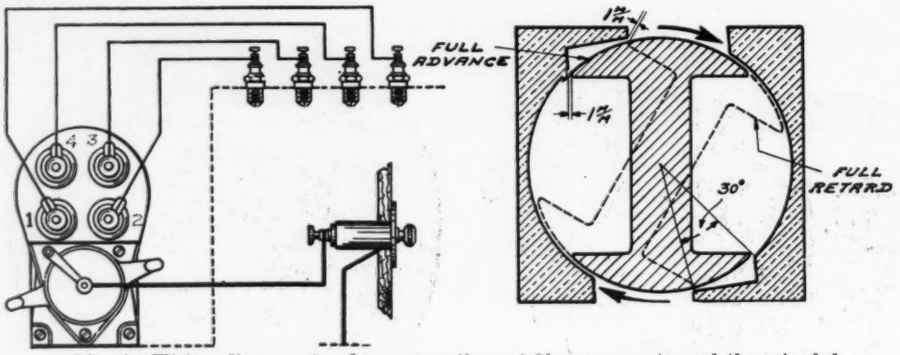


Fig. 4—Wiring diagram to show connections of Simms magneto, and the extended pole shoes with position of the armature with relation to them

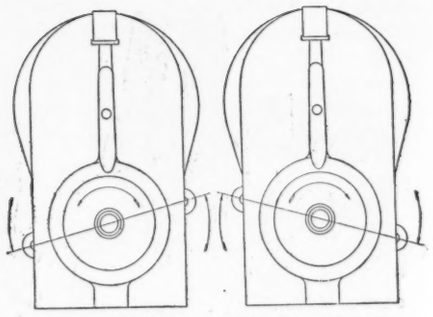


Fig. 5—Positions of full retard of the cam plate when looking at the driving end of the Simplex magneto. The first view is the counter-clockwise setting and the other the clockwise setting

magnetism revolving in a circle. A coil with a soft-iron core is mounted in the magnet and this coil has an iron leg at each end which extends downward, embracing the rotating pole pieces. First the north pole and then the south switches past the legs, making a change which causes alterations in the direction of the magnetism through the core of the coil. This, in conjunction with the breaker mechanism, sends current through the windings.

BERKSHIRE

The Berkshire, a new model this year, follows to a great extent the operating principles of the Dixie. This is a product of the Berkshire Mfg. Co., Pittsfield, Mass. In this machine the magnets are arranged conventionally. There is a rotating armature of iron and aluminum. The construction is such that the machine will produce efficient spark at as low a speed as 50 r.p.m., it is claimed, while the intensity does not build up enough to burn the electrodes of the spark plugs at high speed because the maximum intensity occurs at a comparatively moderate rate. This latter is created because the core of the coil has a limit of magnetization.

One Berkshire model is of the four spark per revolution type, which is run at one-half crankshaft speed in a four-cylinder motor and three-quarter speed in a six cylinder. These types may be made to operate with eight and twelve-cylinder motors with alterations in the gearing and distributer head. Two spark machines are also made. There are no carbon brushes evident in the distributers, the current being taken through brass cylinders projecting from a revolving cylinder of Bakelite.

EISEMANN

The magneto which has received the greatest change is the new Eisemann, type G S, which will be on the market the first of the year. It is a product of the Eisemann Magneto Co., Brooklyn, N. Y. In operating principle and external appearance, it is very similar to the type G 4, having its most striking alteration in the use of a large die casting of aluminum alloy in which the pole pieces are imbedded.

In this casting are the end plates, the bearings of the armature and the distributer shaft. Eight pieces are eliminated together with a number of screws. The casting needs but little machine work, and the great saving of cost effected has brought about a lower price for the new Eisemann models, so it is promised.

Another new feature is the use of a compressed cloth gear which is used in the distributer for quietness.

The impulse starter is still a part of the Eisemann equipment. This is in the form of a spring between the driving pinion in the engine shaft and the armature shaft, which is compressed when the motor is turned over at slow speeds. In the process of compressing the spring a ratchet holds the armature from rotating. As soon as the spring is fully compressed it is automatically released, causing the armature to jump forward, this movement taking place just at the breaking of the contacts. A strong spark is thus produced. As soon as the motor starts to fire a centrifugal device takes care of the catch and the magneto operates normally.

SIMMS

The Simms magneto is a high-tension type with the high-tension winding on the armature. This has not been changed in any way this year. Its important feature is the design of the pole pieces. There are extensions on the edges which follow the direction of rotation of the armature. The effect of these extensions is to keep the edges of the armature in the field of the pole in all positions, from full advance to full retard. At the moment the current is broken the edge of the shuttle is close to the edge of the pole piece. It is a product of the Simms Magneto Co., East Orange, N. J.

REMY

The Remy magneto, a product of the Remy Electric Co., Anderson, Ind., is continued without change. In this design the armature carries but one winding, this being a low tension coil of unusually large size. The distributer is conventionally mounted on the end plate and the coil and condenser is in a separate unit. The switch and coil are integral, the former in front and the latter in back of the cowl board.

K-W

The K-W magnetos manufactured by the K-W Ignition Co., Cleveland, Ohio, are of high-tension design with stationary windings and rotating magnet. The inductor type of construction insures a hot spark at as slow a speed as the motor will

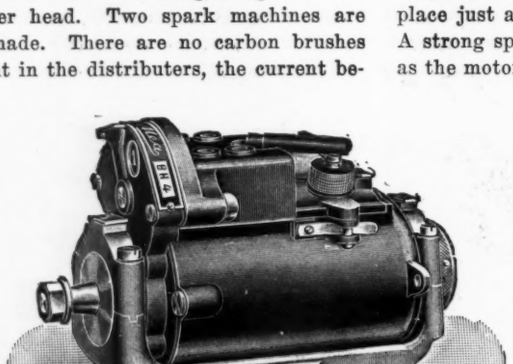


Fig. 6—The exceptionally compact Mea magneto, a product of Marburg Bros., Inc., New York

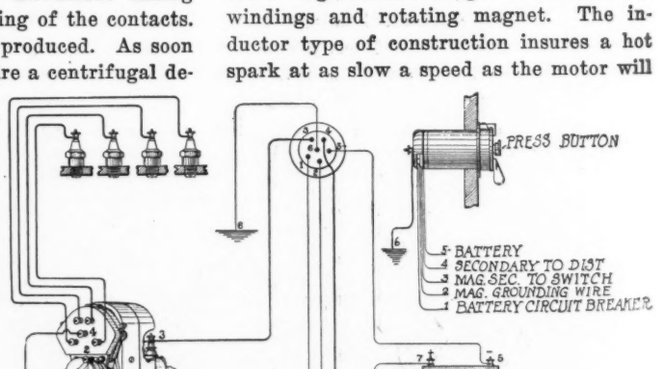


Fig. 7—The Bosch dual system of ignition which has been produced for a number of years without material change

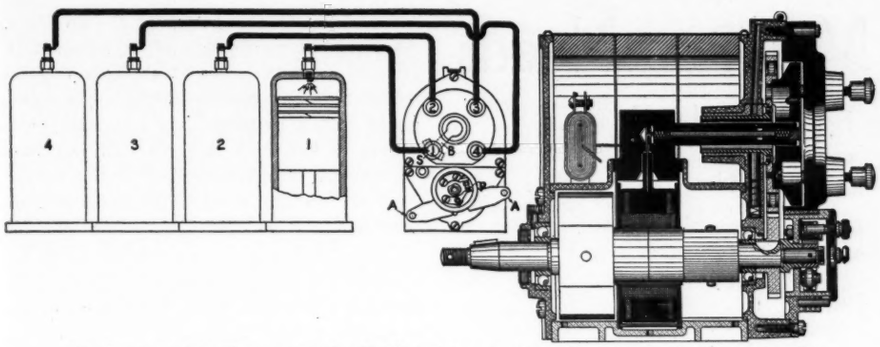


Fig. 8—A wiring diagram of the K.-W. system and section through the magneto, showing ball-bearing suspension

run. The circuit breaking is very rapid, making the operation of a twelve-cylinder motor possible at over 3,000 r.p.m without missing, is the claim. There are four sparks per revolution, allowing the magneto to be driven at motor speed for eight-cylinder motors and one and one-half times motor speed for twelve-cylinder motors. The entire circuit breaker is removable for inspection and adjustment. The circuit breaker, the same on all models, is provided with 30 deg. travel for advance or retard.

SEVISON

An automatic impulse starter is the feature of the new Sevison magneto manufactured by the Sevison Electric Co., Elkhart, Ind. There is a model H which is a strictly high-tension magneto having a compound-wound laminated shutter type armature, a model H J which is the same as the former except that it has a fixed circuit breaker fixed to break the circuit always at the highest peak of the electrical wave and is fitted with an automatic centrifugal governor. The third model is the H I J which is the same as the H J with the addition of the impulse starter.

The impulse starter is inclosed in the body of the automatic governor. When the motor is cranked slowly on compression, the weights of the governor drop to center and cause a quick oscillating impulse of the armature which produces a hot flame spark at the firing point of the motor.

The circuit breaker is the disk type and the operating is performed by a fibre block which comes in contact with the raised portion of the disk cam.

U-H

The magneto offering of the U-H Magneto Co., Inc., New York, is a waterproof high tension type with a unique construction of the magnetic field and an ingenious breaker operation. The pole pieces are cast integral with the base, which construction does not reduce the magnetic flux as does the type in which the poles are set into holes drilled in the base. The U-H is claimed to produce an arc flame of spark. This is attributed to the peculiar construction of the pole pieces.

The opening and closing of the breaker points occur in an axial direction, instead of radially as is usually the case. Thus the pressure exerted on the platinum points is very low and hammering is eliminated.

The automatic spark control is shown sketched in Fig. 12. The timing is entirely taken care of by a small fibre block which, according to speed, rotates faster or slower on the cam disk. This fibre block is fastened to a carriage, made of bronze, which moves in a pair of guides provided for it. As the armature of the magneto rotates the carriage moves by centrifugal force toward the outer end of the breaker disk which is the advance position. With a reduction of speed the carriage returns toward the center by means of a spiral spring, thus bringing the timing mechanism to the retard position.

MEA

It is claimed by the manufacturers of the Mea magneto, Marburg Bros., Inc., New York, that a spark is always produced at the most advantageous point and is not weakened no matter how much it is retarded. The machines are made for all motors up to eight cylinders.

The distinctive feature of the Mea instrument is in the bell-shaped magnets which are placed horizontally and in the same axis with the armature, instead of the customary horse-shoe magnets placed at right angles to the armature. This makes

(Continued on Page 33)

Distributer Ignition Maintenance

(Concluded from page 28)

medium-weight cup grease. If this oiler has a wick, pure vaseline should be used instead.

In a type such as the Pittsfield distributer there is but one adjustment for the contact openings, and this is easily reached on the outside of the case. This type is very easy to disassemble. By removing the distributer cover and coil the distributer mechanism is exposed and, after the key holding the camshaft has been withdrawn the whole shaft can be lifted out.

The Rhoades is another one-adjustment system. The contacts in this distributer should be about $\frac{1}{32}$ inch apart. There is a single oil cup on the distributer and this should be given a drop of motor oil once or twice a week. At least once a month the cover should be removed, and if the cam appears dry a small quantity of sewing machine oil should be put on it. Something to be avoided in a system of this type is to attempt to change the tension of the various springs.

In a system such as the Westinghouse employs the breaker contacts should be adjusted to a maximum opening of .008 inch. A gage is furnished to make this measurement. The distributer brushes should slide freely in the holder and the spring should hold the top brush out to a distance of about ¼ inch from the holder.

Many ignition failures are blamed to the coil and generally unjustly. If total failure of the spark cannot be traced to bad wiring connections or dirty points look at the resistance coil, if it is this type, and see if the wire is intact. The coil primary winding may be tested by connecting a lamp in a series with 110 volts, across the two outside terminals, after opening the circuit through the circuit breaker. If the lamp lights both the coil winding and the resistance unit are right. This test applies to the closed circuit systems such as the Remy.

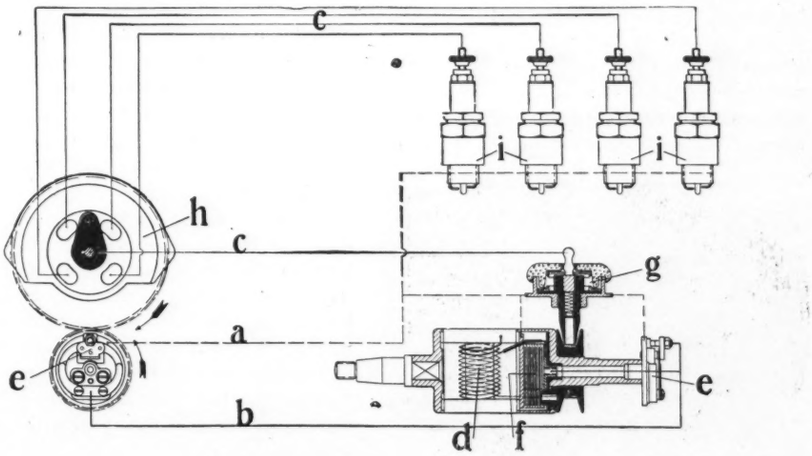


Fig. 9—A typical installation of the Mea magneto. The parts: A, ground through engine; low-tension wire to contact breaker e; c, high-tension leads; h, distributer; and i, spark plugs

The Attention a Magneto Needs

Parts to Adjust and What Should Be and Should Not Be Oiled

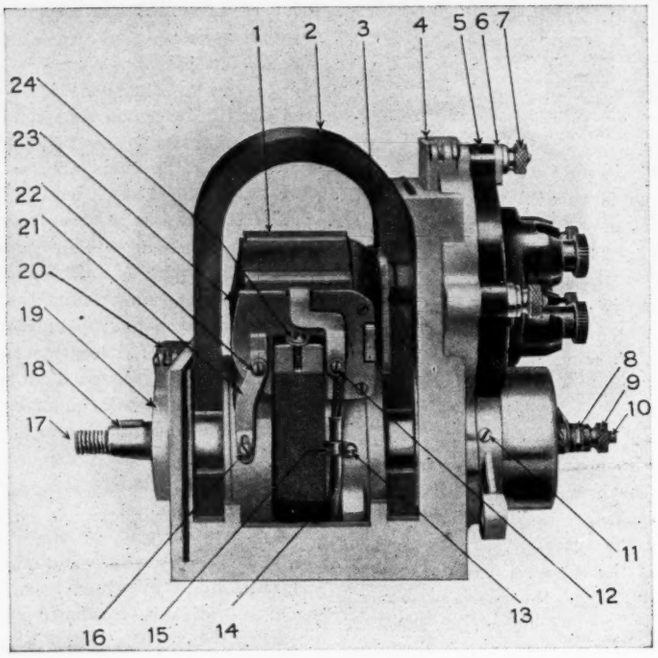


Fig. 10—Names *of parts of a typical magneto, this being the Dixie:* 1—*Condenser,* 2—*Magnet,* 3—*Gap protector,* 4—*Oil hole cover, front,* 5—*Stud for distributer block,* 6—*Clamp for distributor block,* 7—*Thumb nut for distributer block,* 8—*Hexagonal nut for grounding stud,* 9—*Thumb nut for grounding stud,* 10—*Grounding stud,* 11—*Screw and washer for fastening breaker,* 12—*Screw and washer for fastening condenser and primary lead to winding,* 13—*Screw and washer for fastening primary lead tube clamp,* 14—*Primary lead tube,* 15—*Primary lead tube clamp,* 16—*Screw and washer for fastening ground clip to pole structure,* 17—*Rotor shaft,* 18—*drive key,* 19—*Back plate,* 20—*Oil hole cover, back,* 21—*Grounding clip,* 22—*Screw and washer for fastening grounding clip to winding,* 23—*Winding,* 24—*Screw and washer for fastening winding to pole structure*

THE principle things to be remembered in the care of a magneto are that the contact points should be kept clean, parts that need oiling should receive this attention at regular intervals and parts that do not need oiling should be kept free from grease. Water, oil and dust within the armature, commutator and distributer assembles are either going to reduce the efficiency of the instrument or put it out of commission altogether and should be avoided.

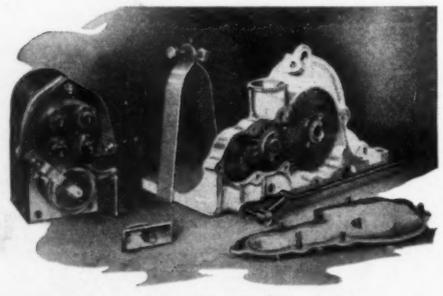


Fig. 11—*The complete Splitdorf magneto equipment for use on Ford cars*

In a magneto such as the Dixie the bearings are provided with oil cups and a few drops of light lubricant every 1,000 miles or so is plenty. The breaker lever should be lubricated at the same time with a drop of light oil applied with a tooth pick. If it is found covered with superfluous oil this should be removed. The platinum points, when separated, should not be more than .020 to .050-in. apart.

In Bosch types such as the ZR4 and ZR6 the breaker arm should be tested to be sure that it is loose on its pivot. The gap between the breaker points should be .016 in. When it becomes necessary to replace a platinum screw, the breaker mechanism may be completely exposed by turning the lock ring a quarter of a turn and removing it together with the breaker housing.

If ignition suddenly fails the trouble is due to a short circuit in the low-tension cable, a faulty connection at the switch or magneto or superfluous dirt, oil or moisture. If the magneto is to blame this may be found out by removing the grounding cable of the magneto. If the motor continues to fire with this wire off the fault is either in the wire itself or at the switch. A faulty carbon distributer bruush is occassionally a cause of ignition failure.

Irregular firing can be attributed to the operation of the breaker. Either the breaker arm is not loose in its seat or the platinum points are dirty or out of adjustment. These points may be flattened and trued up with a fine file. Care should be taken that the surfaces face one another firmly, as an uneven seat will cause arcing of the current with a consequent pitting of the points.

It is always important to make sure that the magneto is fastened firmly to its base and that the shaft is in perfect alignment. All connections should be soldered. Loose connections are the case of about nine-tenths of all ignition trouble.

In a magneto such as the Eisemann the two oil wells should be filled with clean, light oil every 1,500 miles and the oil wick inserted in the timing lever body. The fibre cams should be coated lightly with a drop of oil about every two months.

In the Remy type the breaker points should be set .020 to .025-in. apart and the rebound spring should be not less than .02 from the breaker ar mwhen the points are at the maximum opening.

Magneto timing is a simple proposition, and one rule holds good for practically every kind. The spark should be fully retarded and the piston of one of the cylinders, preferably No. 1 for convenience, should be set at top center, that is with the piston at the extreme top of the cylinder. Then the magneto should be so set that the points are just ready to break for the No. 1 cylinder connection. In other words they should be so set that another fraction of a turn of the magneto and motor when coupled would send a spark through the plug. If the magnneto is coupled to its drive shaft when in this position the motor will be properly timed.

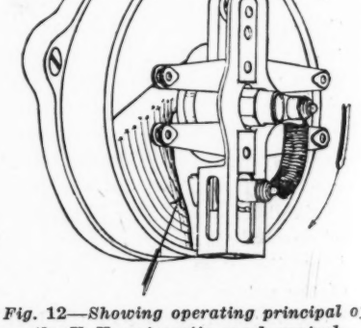


Fig. 12—*Showing operating principal of the U.-H. automatic spark control*

Distributer Ignition Development

(Concluded from page 27)

shaft and is turned by a pin which works against two stops.

The condenser is fastened close to the breaker mechanism below the coil and distributer and all are enclosed in a tube of Bakelized Micarta which forms a body for the assembly. There is a metal ring over the lower part of the tube which can be slipped upward to permit adjustment of the contacts.

RHOADES

The Rhoades battery system, a product of the New York Coil Co., New York, is of the open circuit, single spark type. Following the latest tendency, it has been simplified in its new form, although the operating principles are the same. The principle of operation may be seen by referring to Fig. 18.

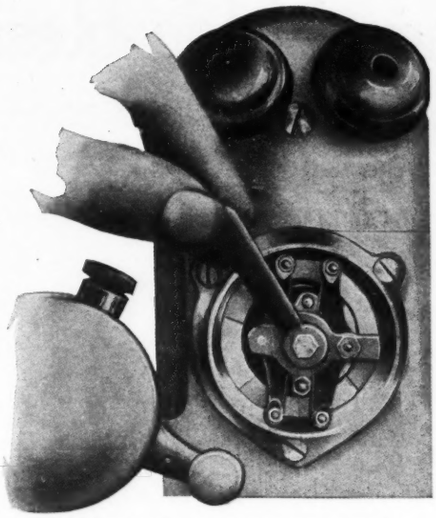
In the first sketch the parts are in the position assumed after the completion of the spark. In the second sketch the cam, No. 6, has pushed the arm, No. 8, outward and the end of the arm is ready to slip off the tooth of the cam. In the third sketch the arm, No. 8, has slipped off the cam and has returned past its normal position. This operation causes the arm to strike the contact carrying spring member, No. 3, closing the contact points and sending the current through the coil. In a fraction of a second the contacts are again separated, the position as shown in the first sketch being assumed. Thus the system draws off enough current to produce one intense spark and the current consumption is very light. The ratchet device, No. 5, allows the cam to remain stationary when the direction is reversed.

WILSON TIRE NOT REORGANIZED

In the November 23 issue of Motor Age it was stated that the Wilson Tire Co. was reorganizing, but we have been advised that this was an eroneous statement and that while W. W. Gardner resigned as treasurer of the company, E. W. Wilson remains as president and that there is no thought of his resigning or of making any changes in the company.

HEAT-OMETER ENJOINED

New York, Dec. 2—In a suit brought by the Moto-Meter Co., Inc., against the Heat-Ometer Co., both of New York, the former has been given a preliminary injunction to stop the latter from selling its products and also from using the word "Heat-Ometer" which was held an infringement on the trademark "Moto-Meter." It is said that the Heat-Ometer Co. removed itself from the jurisdiction of the court and the Moto-Meter Co. then brought suit against the Times Square Automobile Co., which sold the article, a preliminary injunction being granted November 4 restraining the sale and use of the article as well as the use of the Heat-Ometer trademark.



Method of using the special nut provided with the U.-H. magneto for adjusting the platinum contact points of the breaker

What the Year Offers in Magnetos

(Concluded from page 31)

possible simultaneous advance and retard of the breaker and magnets instead of the advance and retard of the breaker alone. It will be seen that, as a result of this construction, the relative position of the armature and the field at the moment of sparking is absolutely maintained, and theoretically, the same quality of spark is produced no matter what the speed may be. Furthermore, the possible range of timing is large. With the standard types of Meas this varies from 45 to 70 deg. but if necessary even this can be increased to any desired amount.

SIMPLEX

Simplex high tension magnetos, products of the Simplex Magneto Co., New York, are of the high tension type featured by an extremely simple interrupter which is so constructed that the centrifugal force of its moving parts is absorbed and the axial pressure between the interrupter points remains the same at all speeds. This gives a hot spark at all speeds. The interrupter points are readily accessible for cleaning, a slight pressure of the thumb swinging the arm outward. These machines are continued without change.

HEINZE

There has been no change in the Heinze magneto made by the Heinze Electric Co., Lowell, Mass. It is the true low-tension type in which the induction coil is separate from the magneto.

Ticker Tells Car Value

Yale-Harvard Football Results Sandwiched Between Pathfinder Publicity Notices

Boston Dealer Devises Unique Plan of Getting Attention of Public

BOSTON, Mass., Dec. 2—"How to Market a Motor Car," or "Stimulating Winter Business," either title would be a fitting caption for the story of how Harry Fosdick brought the Pathfinder to the attention of wealthy men in Boston, and the tale has its humorous side, too, for several of the Boston dealers were forced to hear about the dealer and the car regardless of their feelings. Boston has a ticker service that goes to all the big hotels, clubs and financial houses. It is operated in connection with The Boston Financial News. When Mr. Fosdick took on the Pathfinder one of the solicitors called seeking an advertisement. The dealer knew all about the ticker service, and so he inquired what the prospect would be to have a few lines about the car sent out on it. The solicitor said it could be done some day. Fosdick picked the day—the psychological time—the afternoon of the Harvard-Yale football game, a Saturday afternoon. The ticker service on that day sent out the story of the game play by play, also some other sporting events.

At some of the clubs like The Boston Athletic Association several of the dealers were present and they were interested in what was going on at New Haven. Shortly after 2 the ticker began to unwind itself and tell its story to the gathered throngs hovering about the little machines in various places. Right after the opening announcement that the players had gone on the field for practice there appeared a heading:

HARRY FOSDICK REAL PATHFINDER.

Then followed a 75-word notice about the car and the new agency. As men were standing about the tickers reading what was being printed, the news was transmitted aloud for the benefit of those in the rear. That was a good starter. Then followed the story of the game for the first period. When the end of the first quarter was reached the ticker kept right on spelling out its words. As the football enthusiasts read it the next few words, comprising about five lines of type, told some more about the Pathfinder.

The second period ended, but the ticker did not stop. By that time the name of the Pathfinder began to sink in and there was some comment about the car. Then came the end with the announcement of Yale winning. Again the ticker kept up, and before the the people had a chance to get away the words formed: "Fosdick Wins."

Upholds Taxing of Non-Resident Motorists

United States Supreme Court Rules State May Make Users Pay for Road Wear

WASHINGTON, D. C., Dec. 4 — The United States Supreme court, in a decision today, established the right of any state to tax non-resident motor car owners for the use of their roads. The decision is of national import in that it lays the way open to drastic changes in the laws of those states which should decide to take advantage of today's ruling.

According to the decision a state may impose a tax on the use of non-resident motor cars rather than upon the machines themselves to compensate it for the wear and tear on highways. The decision was the result of the arrest of F. G. Kane of New York for operating a car in New Jersey without registering his car there.

The case was based on the violation of three provisions of the New Jersey law:

First, that Kane had failed to register his car in New Jersey; second, that he failed to pay the tax imposed on non-residents, and third, that he failed to file with the Secretary of State a power of attorney. The last provision was to enable residents who had suffered injury at the hands of non-resident motorists to prosecute their claims for redress in that state instead of being compelled to follow the non-resident to his home state, wherever that might be. Both New Jersey and Maryland imposed a graduated license tax on both residents and non-residents, based upon horsepower, in January, 1915.

The Supreme Court upholds the Maryland statute as not burdensome on interstate commerce, but, in the New Jersey case the contention was made that the taxes were not solely for administration costs of regulation and registration of motor car traffic, as was the case in Maryland.

The law in question is that of 1906, as amended in 1908 and known as the Freylinghuysen law, which has been since considerably modified though New Jersey has, since the litigation started, adopted reciprocal legislation as to visiting motorists. The decision, really a test case, may change the laws of the states, even going so far as to nullify all reciprocal relations between the various states.

DOES 376 MILES IN 9 HOURS

Indianapolis, Ind., Dec. 5—A Maxwell touring car, carrying four passengers and driven by Ray McNamara last Friday in an endurance run, covered the distance from Indianapolis to Chicago and return in 9 hr., the average speed for the total distance of 376 miles being 41.7 miles an hour. The test was made under the direction of representatives of the Hoosier Motor Club of Indianapolis. The car covered the distance from Indianapolis to Chicago in 4 hr. 15 min., and after stopping 15 min. to take on gas and oil made the return trip in 4 hr. 45 min. The run was made under the direction of J. S. McFarland, secretary of the Coles Sales Co. of Indiana, Cole and Maxwell distributor. The trip to Chicago and back was made in 55 min. less time than the distance is covered by the two fastest railroad trains traveling between the two points.

CAR SHORTAGE FELT AT FLINT

Detroit, Dec. 4—The Chevrolet Motor Co. has been forced to double deck the ordinary freight cars, shipping motor cars in many pieces in order to load them, and putting six cars in a freight car instead of three as ordinarily, in its efforts to overcome the freight car shortage. Every motor car maker in Flint is suffering from the shortage. Incoming freight shipments are piled up at the various freight receiving sheds. Railroads are making every effort to relieve the congestion.

DRIVES CARS TO DEALER

Lansing, Mich., Dec. 4—The Reo Motor Co. is driving more than 70 per cent of its output to dealers within a radius of 1,000 miles in order to overcome the scarcity of freight cars, and up to the present has been fortunate enough to escape great hardship. The company plans to use flat cars when severe winter weather prevents driving.

HERSCHELL-SPILLMAN CAPITAL UP

North Tonawanda, N. Y., Dec. 2—The Herschell-Spillman Co. will increase its capital stock on January 1, 1917, from $250,000 to $750,000. This increase in stock is made necessary in order to provide facilities to take care of the company's heavy increase in business during the last year.

CAR EXPORTS INCREASE

Washington, D. C., Dec. 2—The feature of the export trade in October was increased exports of passenger cars and parts with a diminution of exports in commercial cars. Figures just announced by the Department of Commerce show that during October last there were 1,144 commercial cars, valued at $3,635,291, and 4,880 passenger cars, valued at $3,756,768, together with parts to the value of $1,949,060, exported to various foreign countries.

For the corresponding month of last year the figures were: Commercial cars, 1,596, valued at $4,307,190; passenger cars, 3,479, valued at $2,749,255; parts not including engines and tires, $1,819,950.

During the 10 months of 1916 the figures show that 15,917 commercial cars, valued at $44,006,346, and 51,699 passenger cars, valued at $36,049,497, together with parts, not including engines and tires, to the value of $20,091,793, were shipped abroad. During the same period of last year the commercial car exports numbered 18,865 machines, valued at $52,076,406 and passenger cars to the number of 34,515, valued at $29,543,227. The exports of parts, not including engines and tires, were valued at $12,814,809.

The big buyers in October last were as follows: France, 522 cars, valued at $1,782,088; United Kingdom, 684 cars, valued at $1,687,152; Canada, 1,021 cars, valued at $718,962; West Indies and Bermuda, 665 cars, valued at $505,198.

STOUT PLANS AEROPLANE CLUBS

Detroit, Dec. 4—W. B. Stout, manager of the aircraft division of the Packard Motor Car Co., plans to organize model aircraft clubs in all of the Detroit high schools. Mr. Stout organized a similar club in Chicago under the name of the Model Aero Club of Illinois. The organization developed aeroplanes from models. It is planned through the new club to be organized here to bring all of the different Detroit organizations interested in aviation together annually in competition.

HUPP ON WAY TO AUSTIN

Detroit, Dec. 4—The Hupmobile capital-to-capital tour is now on its way to Austin, Tex., following its arrival at Phoenix, Ariz. The car has visited thirty-six capitals and covered more than 12,800 miles to date.

NO POSTERS ON STATE ROADS

Bloomington, Ill., Dec. 2—Touring motorists will get the benefit of the efforts of the Illinois state highway commission to eliminate unsightly signs of an advertising character along the public roads. B. H. Pipemier, maintenance engineer of the commission, has notified all county superintendent of highways in Illinois, to see that such signs are removed from state aid roads. The county officers are asked to co-operate with the state in securing their removal. No advertising of any kind will be permitted. Signs placed on property contiguous to the roads cannot, of course, be reached, as this rests with the owner of the land who secures rental. It is believed, however, that the majority of the property owners will be willing to join.

From the Woman's Viewpoint

On Making a Glad Gift Tree

As I was going to market-town
Upon the seat I sat me down
In motor car that cheerily
Had promised far to carry me
If such my wishes came to be
When I'd decided what I'd see.

As up I motored to market-town
I met a neighbor coming down,
And thus she quoth: "An awful plight
Was spread before my eyes last night:
The Day of Gifts had come to be
And little elfs did torment me
Of friends that early waked to see
From thought of presents I'd been free."

So she had been to market-town
Full warned by premonition's frown
To seek the shops for surcease cure
Of dire procrastination's lure;
For if she wished no more to see
That selfsame scene's calamity,
She'd have to start her Christmas tree
And let procrastination be.

And as she came to market-town
And thought on what had brought her down,
She wondered what she'd better buy
For Sue and Nelle and Mrs. Fry:
She saw of gifts a galaxy,
And knew at once how hard 'twould be
To pick and choose from all she'd see—
'Twas thus she met and greeted me.

From out my car for market-town
I leaned and to her reached me down
To better emphasize my word
That was to mark all dread absurd:
"Why take it all so wearily?
Just buy a motor gift! That'll be
The best for anyone, you'll see."
Was how I answered her sad plea.

Again I walk through market-town,
To which my car has brought me down:
All bent on naming motor gifts
That there may be for you no rifts
Within the joy which seems to be
A requisite if you we'd see
A maker of a glad gift tree.

ONCE upon a time it was a common and very sad practice for all dwellers of the earth to dread muchly and speak harshly of the day on which the good saint Claus is king. Divers complaints were abroad in the land, and no matter how early the good saint placed his wares on display or how soon his co-workers admonished the community to do it early the great day dawned on a tired and exhausted commingling of relief, joy and disappointment.

The advent of the motor car in the nineteenth century did do much to lift this pall which blackened the sky of our fair universe by hastening overmuch the getting about of men and women and their acquisitions. But the rain that comes to freshen the grasses and flowers of the earth also brings dark skies, and even as the getting about of men and women and their acquisitions was hastened the men and women met oftener and in more numbers so that the circle of acquaintance grew ever larger and the friends whom they would remember on that glad saint day multiplied.

Car Extended Gift Field

Now it came about that someone discovered a silver lining back of the clouds that the rainy day brings, together with much general gloom. And the men and women and their acquisitions whose getting about was hastened heard of the great discovery, so that the men and women grew more joyful and the acquisitions took unto themselves other members into the gift-possibilities society. The honk of the loud horn was heard much in the land, and every car owner looked on one with envious eyes, but some there were who bought them not, but received them from the saint, who likewise dispensed other aids to motoring, such as goggles, robes, lunch kits and the countless kindred heritages of the motor car.

Then was much joy among the men and women who must visit the shops and pick out from the multitude this for Wilhemina and that for William. For of those things most dear and most acceptable were gifts even the giver could rejoice in, all of which makes of preparation for the day on which the good saint Claus is king by no means a task, a sad state of affairs which availed weary much in the old days.

But some there were who knew not the little things in motoring use and turned away from the over luxurious, purse-proud fittings so ably showing in the star acts of the great show. And again was there much worry and indecision as what was what and how much.

Now there were others who thought of this doleful predicament and found it cureable, and being, for the most part, of civic consciences, they set chemists to analyzing the general content of the motor offerings so that even the least of these remembrances that men and women were so fond of giving would be available. To this end the chemists haunted the shops patiently often and inquired into the state of the quotations so that only those ingredients of average purchase-ability would remain when the general contents had been boiled, strained and settled.

As a result the men and women and their acquisitions, whose getting about was hastened by the motor car, came into much brightness and would have exchanged places with no other time, for the men and women, who had acquired new friends whom they would remember, and the acquisitions, who had taken unto themselves other members in the gift-possibilities society, found that they could now unite in making the trees they were to adorn on the day on which the good saint Claus is king, glad gift trees.

Now, among the ingredients of average purchase-ability were these, of which it was the good fortune of some to learn:

Goggles—There are goggles and goggles, but even the least of them afford much protection against dust and wind and are of much good.

Robes—To the old-fashioned plush robe of carriage days, at which period it gave way only to the linen robe of summer, are added other robes, some of wool, some of fur and others of leather, all of which are bedight with sundry patterns and glorifications such as much color and design. But reasonable wool robes there are which will keep many a rheumatic pain from a friend.

Sewing kit—A few may hold that preparedness should come before journeys; they have not known the fortunes of motoring are much like those of other traveling in this respect: A stitch in time saves nine. And a sewing kit may be as elaborate or as simple as one pleases, from foreign marts or the corner store as one chooses, or even the product of friendly fingers.

Drinking cup—Of drinking cups much has been said by nation, state and town. Little and big folk have a trick of losing them, too, which is another argument that makes them eligible for the gifts-possibilities society.

Rubber wash basin—This fair creation is not so well known as it might be, but it is to become more well known, for the rubber wash basin has many things to recommend it, among which are ease of portage, small space and appearance—this last is from one who in the old days did pass by many farmhouses and behold on the back porches thereof the old wash basin that left much to be desired by the eye and more by the ear when it was taken therefrom and carried on a journey.

Why Not a Collapsible Cupboard?

Collapsible cupboard—If the motor trip does require much eating while distant from commoner practices of dining, what better than the collapsible cupboard to hold the articles to be prepared over the camp fire when they have been unpacked from the carriers? The collapsible part is to facilitate packing.

Blanket pins—Rather prosaic one might dub the blanket pins, but one who has slept chillily beneath a movable blanket will find them lulling in their music. Blanket pins, by the way, are special jobs, stronger, it is said, than our friend, the safety.

Compass—Whether or no the motorist might need a compass is not the question. Did you never want to be able to tell north and south in a strange field when a child? What other excuse is necessary?

Night watch with luminous hands and

figures—A night watch may be an elaborate or simple gift. To you remains the decision.

Duffle bag—Duffle is a good word. A necessary word is bag, though it may be under other guise. This one in mind has a lock and handles and is waterproof.

Money belt—To him who hath a money belt will be given much security, for large pockets for the bills and small ones for the change bring unto the man or woman freedom from much worry.

First aid case—Safety first requires the first aid case, for first aid means safety from serious consequences of small hurts sometimes.

Waterproof toilet case—In the waterproof toilet case many things may lie, among them the necessary brush, comb, powder, toothbrush, cold cream, soap, wash cloth, nail brush, file and orange stick. Some there are that read more simply; any are of comfort on a motoring jaunt.

Veil—To the feminine motorist the veil is always of moment. The gift might include pin and case for protection also.

Flask—The flask has many uses, all of which are not lacking from many motoring parties. The flash that comes in leathern protection and with glass stopper may carry medicine, the alcohol some consider necessary or nothing more important than water.

The Air Cushion's Advantage

Air cushion—The motorist is by no means an invalid, but the air cushion of the invalid fits well on a trip. It may be square or round, but if it is of air structure within it can be easily packed away when not in use.

Magnifying glass—Another oft-wished wish of childhood and a pleasant rather than necessary accessory of the car.

Laundry bag that can be shipped—In the college towns the pasteboard laundry bag that can be sent by parcel post is a common article. For the tourist it would be as fitting and is more adequate than a suitcase for this purpose.

Writing case—No excuse for not writing could be found if you would give the friend who is to start on a tour soon after the first of the year a case with stationery fittings complete.

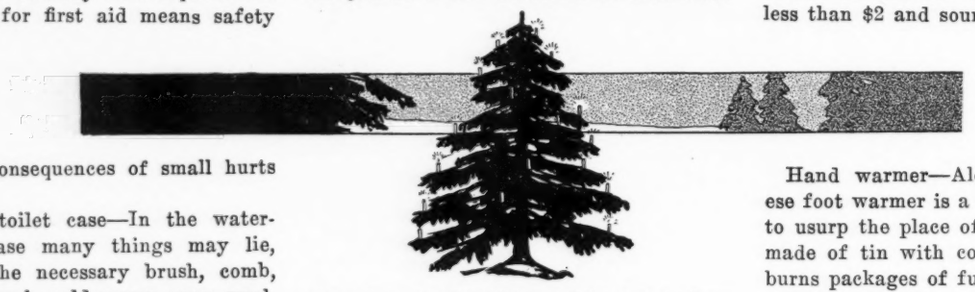
An extra seat—Even the seven-passenger car needs an extra seat sometimes, and there are those extra seats that look well when in sight, are folded and put out of sight easily and do not obtrude in any way.

Limousine case—If 'tis in town she motors, and all in a gay limousine, cases just for that purpose come with mirror, powder book and bottles.

Gloves—To the motorist, whether driver or observer, gloves are a necessity. For the driver, an extra pair of canvas, probably, to carry along for repairs and dirty work, is very acceptable. The gauntlet seems much in favor just now, and for motoring it is especially suitable, as the cuffs protect the wrists and keep the wind out of the sleeves.

Folding manicure set—Folding manicure sets come in such compact form that they can be obtained of a thickness no greater than a fat letter.

Vanity case—Vanity cases are multiple. One contains merely a lip stick and a powder puff in a box enameled to match the colored crushed calfskin of its case; others contain more articles and are on more elaborate scale. It is the same thing, however; it is a vanity case, whether in disguise or not, and a vanity case is a staple nowadays.



Traveling clock—A traveling clock for traveling motorists. This may be in the form of a clock for the cowl board or one that is set up in camp.

Collar and cuff set—The end of the journey finds weariness of clothes, if not of person, and if a collar and cuff set is fresh for attachment to the weary garment, the whole appearance is brightened. This is particularly apt when the trip is of a day's length between hotels, and one's wardrobe is limited.

Sweater—A sweater has become part of the motorist's wardrobe. For many days it can supplant the heavy long coat, often so bundlesome in the tonneau. On the coldest days, it supplements the heavy coat and helps defy chill.

Knitted cap—Winter time brings colder feelings, and the head knows the influence of the change. Besides, the knitted cap goes well with the sweater; the two may even match.

Knitted scarf — Talking of caps and sweaters, the woolen scarfs prove much more satisfactory than furs sometimes, besides having more purchase-ability. They come in vivid colors, in catchy patterns and different fabrics, among them Scotch wool and silk fiber.

Crepe paper lunch set—Fine linen and silver is all very well in its place, but many persons think its place is at home, and perhaps some of those you would remember do, too. These sets come in boxes and contain lunch cloth, napkins, wooden plates and even forks, though the cloth and napkins can be bought separately also.

Pillow with handles — Quite different from the air cushion is the pillow with handles now shown for motorists' particular use. The handles can be slipped over the arms so that the pillow remains in place at the back, or the pillow can be used as other pillows—as an aid to ease.

Pliable cushions for backs of auxiliary seats—The market now offers pliable cushions, quilted-like in appearance, that fit—and remain—over the back of the seven-passenger's auxiliary seats and thus add to the comfort of the riders therein.

Foot warmer—Along with the Japanese offerings that seem to flood the shops about Christmas time is a foot warmer of reinforced tin covered with velvet. It costs less than $2 and sounds practical.

Hand warmer—Along with the Japanese foot warmer is a warmer for the hands to usurp the place of the muff. It also is made of tin with covering of velvet and burns packages of fuel.

Motor hat—The best hats, when it comes to keeping out the dust, especially, are said to be those that came into being about 5 or more years ago. They are not seen so often now on the town streets, but on the long tour their popularity still exists. This is the hat that is more hoodlike than not, with the streamers that tie closely under the chin. With a good veil the protection is complete.

A Kodak? Of Course

Kodak—Modern enterprise has brought the kodak and camera in the reach of all who wish such. As a gift for the motorist, why not?

Food bags—These food bags now in mind are for the motorist who takes his car and strikes for the sparsely settled haunts of man every once in a while. If you are acquainted with this kind of friend, the food bags for carrying staple groceries would be a good gift. The bags are for packing in a duffle bag. Pantasote, an imitation leather, is for the bacon, and tin for lard or butter. Friction top tin cans are included, and the bags hold from 5 to 10 pounds of food.

Pocket cook kit—A pocket cook kit can be obtained for the camping motorist. It has frying pans, boiler and drinking cups.

Water bottles—The Southwestern tourist finds he needs water bags. They can be either aluminum canteens, waterproof duck or South African bags.

Camp blankets—Camp blankets furnish another item for the motorist who stops by the wayside.

Tonneau refrigerator basket—Often, you know, the refrigerator goes motoring, and baskets built for this purpose are offered at reasonable cost.

Thermos products — Food jars, bottles and regular motor car restaurants are included in the Thermos products, all of which make welcome gifts, whether it be the humble beginning, the bottle, that is received, or the more elaborate products of later origin.

Pocket knife in case—On the face of it a pocket knife does not seem so much a part of motoring, but motorists who tour any or go out on picnic trips find it very useful. A strong knife is best.

Outfit for cooking—Plates, cup and utensils of unbreakable material are necessary for the motorist who also cooks from time to time in the midst of his motoring.

Robe rail pockets—Flat bags are being made for the robe rail, to which they are fastened by straps. They contain a great deal and do not take much room.

Running board lunch box—Nothing is so good for a running board lunch box as a tool box in disguise. Partitions may be used to make space for different articles.

Radiator emblem—What would be more novel a present than an emblem of some kind to pose constantly on the radiator and go on before the car in fair or sunny weather?

Skirt hangers—A neat leather case contains half a dozen or more celluloid clothes pins, with which skirts are to be hung over a wire or rope stretched conveniently in tent, strange room or other place without such accessories.

Pullman slippers—Pullman slippers are good for motoring trips as well as for Pullman trips. They take little room and are soft and comfortable to tired feet.

For the Hasty Line

A reminder—Lest they forget the little things that are to be done, they should have a memorandum book of some kind. The hasty-line-or-two kind is good. It comes in leather case, with pencil or fountain pen and pocket for stamps even.

Footstool—'Tis true the maker of the motor car tries his best to make cushion seat and rider thereon agree in distance from the floor, but it takes more years than there has been for such an ideal situation, and meanwhile a footstool offers the best solution for the problem. Some closed cars are fitted thus; all cars can be fitted so with the addition of a small stool from the store.

Folding camp cot—A camp cot that folds into a compact package of about 3 feet in length can be obtained for less than $3.

Wrist watch—Wrist watches that stand all kinds of rough usage come in waterproof strap and are so low-priced that one can afford to lose them.

Overalls—If your friend tends his or her own car, why not some fancy overalls that come just for this purpose, either in the regulation overall style or in long duster fashion?

Blue Book—If your friend touring goes also, how about a Blue Book for that section of the country he expects to visit? Or road maps can be obtained from local and state highway departments.

Pocket lunch kit—Knife, fork and spoon in a leather case that fits snugly into the coat pocket need nothing but the food to make the lunch complete.

Foot mat for running board—Not long ago Motor Age told of a doormat used to keep mud from the tonneau. Well, a foot mat just for this purpose can be purchased at the shops.

Another kind of laundry bag—You have seen the mail bag Uncle Sam uses, and perhaps you have noticed the type of lock used to keep its contents secure. A laundry bag much on this same order will help make touring more comfortable as it can be dropped at parcel post or express office and will carry its contents safely homeward.

Adjustable shoe trees—Adjustable shoe trees can be packed more easily and at the same time fulfill their requirements of helping keep the shoes in good order. Something for the week-end trip, especially.

Folding hangers — Hangers also make good presents for the motorists who tour.

Camp Stove—Camping is supposed to be a hardening process, and the camper, if he or she follow the logical order of events, will become callous to cold and minor discomforts of chilly mornings and chillier water. But if a camp stove accompany the camper, surely the small room it takes en route and the large amount of comfort it gives in camp can brave any accusations of weakness in heating the roadside tent. Besides, camp stoves are made especially for the motor car, to be used within them or the tents they so often carry, particularly on tours.

Telescope—One middle-aged woman once said that she thought every motor car ought to be fitted with a telescope when touring. It was so nice to know in advance what you were going to see along the road.

A Suggestion or Two as to Probable Cost

Now there are probably some who think it's all very well and good to say these different articles belong to the gift-possibilities society, but what about the cost? For the benefit of those the following general classification is given. The gifts themselves were suggested with the idea that surely among these are those available in your particular community and for your particular pocketbook.

Two or Three at $10

Motor robe
Limousine case
Beaded bag
Camp stove
Silk scarf
Telescope

More for $5

Sweater coat
Tonneau refrigerator basket
Robe rail pocket
Laundry bag with lock
Aluminum knives and forks
Motor car stove
Aluminum folding baker
Limousine vase
Veil pin and hat pin set
Gold pencil for chain

What $4 May Buy

First aid case
Waterproof toilet set
Traveling clock
Motor car robe clips
Camp blanket
Radiator monogram
Wrist watch
Mat for running board
Night watch

Some Chances at $3

Sewing bag
Air cushion
Extra seat
Cap and scarf set
Traveling alcohol lamp
Folding camp cot
Overalls
Blue Book
Scissors set
Velvet tam
Wool scarf
Wool cap

Opportunities at $2

Collapsible cupboard
Duffle bag
Flask with leather cover
Writing case
Cushion with handles
Foot warmer
Dozen food bags
Traveler's mirror
Darning roll
Water bottle
Thermos bottle
Cooking outfit
Pocket cook kit
Pullman slippers
Footstool
Whistle for chain
Record book
Laundry drying kit
Folding pocket scissors
Crocheted vest
Gauntlets
Pocket knife
Handkerchief case
Whistle on wrist strap
Clothes brush
Chinese "Good Luck" ring
Sandals of monkey skin
Veil pin
Lingerie clasps
Rubber blanket
Hot water bottle
Water bag
Heel protectors

The Big List for $1

Goggles
Drinking cup
Rubberized basin
Blanket pins
Compass
Money belt
Veil
Magnifying glass
Pasteboard laundry bag
Canvas gloves
Folding manicure set
Vanity case
Collar and cuff set
Paper lunch set
Hand warmer
Kodak
Fountain pen
Wrist purse
Bag tag
Address book
Clothespin skirt hanger
Hasty-line-or-two
Adjustable shoe trees
Folding hanger
Folding bucket
Paper napkins
Paper cups
Silk quilted vest
Sachet set
Solid alcohol cooker
Whiskbroom in case
Shoe bag
Silver key ring
Shoe polisher
Hat brim clasps
Wash cloth in case
Toothbrush bottle

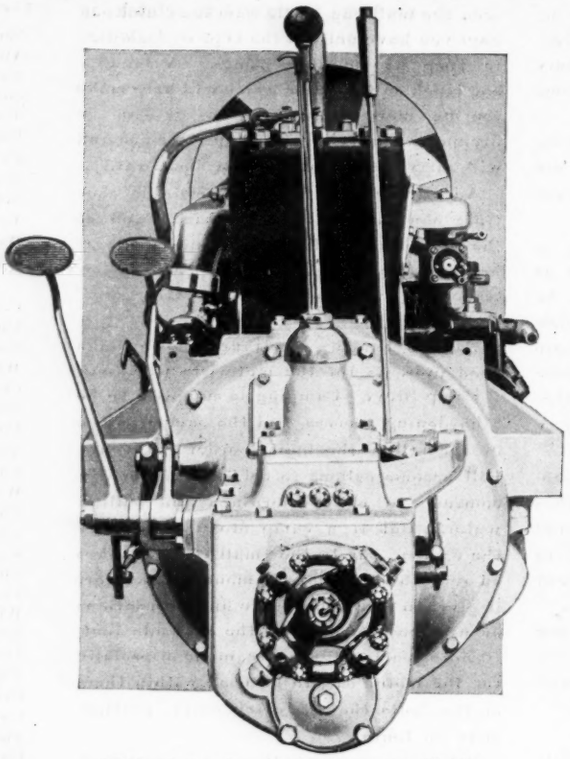
Sixteen-Valve, Four-Cylinder White

Cleveland Concern Brings Out New Model with Four Valves Per Cylinder

High Efficiency Object of New Design — Six-Cylinder Models Are Continued

A FOUR-CYLINDER engine with sixteen-valves is the feature of new White cars on which production is just starting at the Cleveland factory. This makes the second factory of importance to announce an engine with four valves per cylinder as stock production. Not only is the engine itself a radical departure from the six-cylinder, twelve-valve engine which has been the feature for many years, but there are also a number of other innovations in the chassis which are noticeable departures from previous practice of this company. A unit powerplant incorporating a plain bearing crankshaft both are departures from the Cleveland factory design. This is the first time that cars of this concern's manufacture have had the engine, clutch and gearset in the unit. The new engine with its plain bearings differ from the ball bearing design which is continued on the other model.

Likewise, the cylinders have removable heads and instead of the dash oil reservoir, the oil is carried in the lower part of the crankcase. Alterations which mark advancement in design are found throughout the chassis. The gearset lever is a cane type with a standard gate, replacing the cross-over shifting arrangement formerly employed. Instead of the brake lever being at the left side, it is now in the center, giving a clear passageway to the left front door. Semi-elliptic springs are employed and spare tires have been removed to conventional location in the rear



End view of new White powerplant, showing shape of four-valve cylinders

instead of being carried in a well on the running board as has been previous practice.

Naturally chief interest will be centered in the new engine. The double intake and exhaust valves are employed to give the highest possible volumetric efficiency of the engine, the White company summing up the reasons in the words "valve efficiency is more important than the number of cylinders." The 4¼ by 5¾ T-head cylinders are cast into blocks with the valves located one at each corner. Cylinders are cast with an open arch between the two middle cylinders for lightness and also as a factor in preheating the carbureter air.

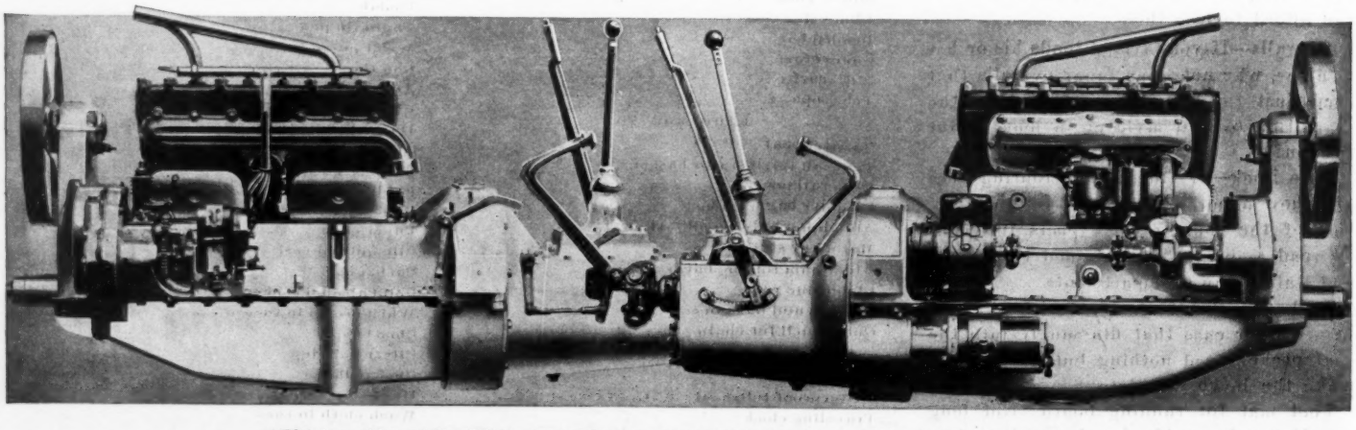
While the cylinder is a T-head construction, the valves are set at an angle to the vertical, probably to lead the gases directly to their respective ports with the smallest amount of baffling effects.

The head casting is entirely separate and contains no valve plugs, somewhat unusual with a T-head engine. The spark plugs are screwed directly through the center of the cylinder head, giving the best position for rapid flame propogation and freedom from gas pockets. By taking out approximately 14 studs, the head casting can be removed, the spark plugs coming off with it.

Removal of the cylinder head opens up the valves and combustion chambers for valve grinding and carbon removing. Fifteen minutes is required to remove the head and about 5 min. to take off the side with a T-head engine. The spark plugs are screwed directly through the center of the cylinder head, giving the best position for rapid flame propogation and freedom from gas pockets. By taking out approximately fourteen studs, the head casting can be removed, the spark plugs coming off with it.

Removal of the cylinder head opens up the valves and combustion chambers for valve grinding and carbon removing. Fifteen minutes is required to remove the head and about 5 min. to take off the side cover plates to get at springs in adjusting them.

Weights of pistons and other reciprocated parts have been kept low, as is to be expected in the high-speed engine. The

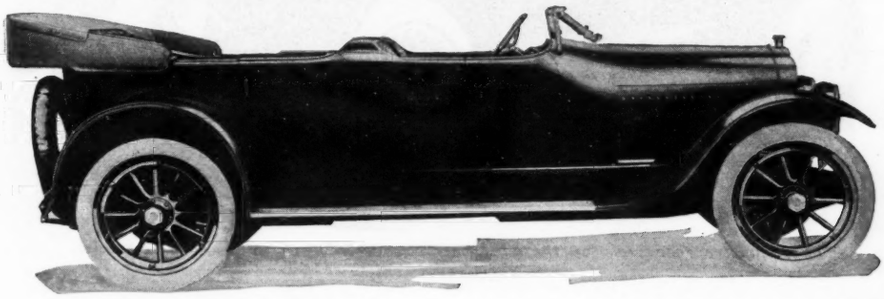


The two sides of the White four-cylinder powerplant, showing arrangement of the units

pistons are of alloy and the rods are forged I-beams. The crankshaft is carried on three bearings, babbit-lined and is kept in running balance by a series of counterweights. The two camshafts are driven by helical gears.

A full pressure system without splash is used for a lubrication and gear pump forces oil to the main bearings under pressure proportional to engine speed. The oil is then lead through the hollow crankshaft and drilled leads through the crank cheecks directly to the lower rod bearings. Pistons and cylinders are lubricated by a spray from the cranks, the oil returning to a reservoir in the bottom of the crankcase.

When the pan is dropped, main bearings and connecting rod bearings become accessible for adjustment because all the



Touring model with divided front seats and double cowl fitted to the sixteen-valve motored chassis

main bearings are carried in the upper half of the crankcase. Pistons and connecting rods can be removed from the bottom so it is not necessary to remove the cylinder block for this purpose.

The fuel feed system is vacuum gravity, rear. A White barrel-type carbureter is employed, bolted to an intake on the cylin the main fuel tank being carried at the der casting, so that there is no header between carbureter and intake manifold. The hot air is taken from the adjustable stove on the exhaust pipe and through the arch in the center of the cylinder casting. The adjustable stove employs a shutter valve through which cool air can be admitted, thus tempering the air coming from the exhaust pipe.

A feature of accessibility of this carbureter is that both nozzles can be removed as a unit for cleaning by taking out two bolts and the only adjustment on the carbureter is a knurled nut which adjusts the proportions of the mixture. Circulation of cooling water is obtained by a pump mounted on the generator shaft. The fan is aluminum with six plates and is driven by silent chain which is inclosed. Adjustment is provided by mounting a fan sprocket on an eccentric which alters the distance between sprockets.

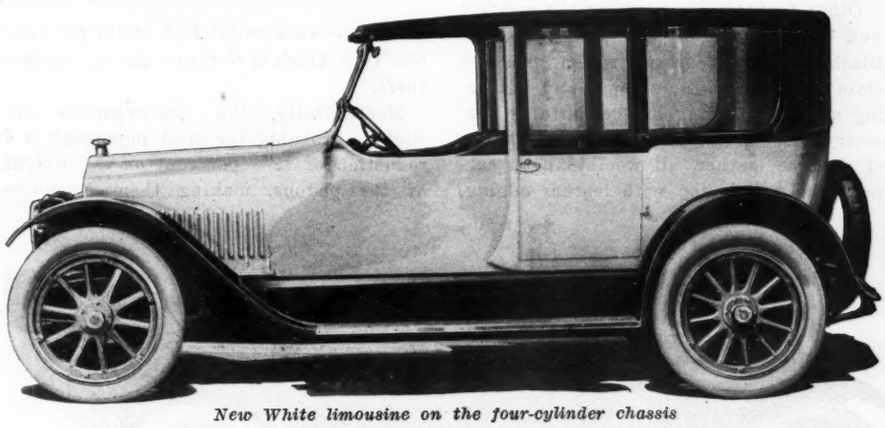
Two-unit lighting and starting of Leece-Neville manufacture and high-tension magneto are employed. The junction box is very accessibly located being directly on top of the generator. Motor drive is through Bendix gear to a ring gear on the flywheel. Current is supplied by 12-volt 757 amp. Willard or Exide storage battery.

A fabric-faced, single-plate clutch is used and this runs in oil and transmits the power to a White four-speed gearbox which is stepped up on fourth as in previous designs. Gearset is carried on ball bearings and there is a removable plate at the bottom of the box through which a layshaft may be withdrawn ,thus saving a great deal of time on repairs.

A drive to the semi-floating rear axle through two universals and a telescopic joint and both torque and drive are taken through the long semi-elliptic springs which are underslung beneath the axle.

The chassis is made in two wheelbase lengths, 137 inches for the touring, limousine and landaulet and 24½ in. for the runabout, sedan and coupe. The tire size is 37 by 5 with Goodyear and Goodrich cord tire options.

New bodies have been designed throughout for the sixteen-valve, four-cylinder chassis. The touring car is a center-cowl divided-front seat design with a sloping windshield. An option of color finishes is offered. There is a new design of easily manipulated top, which the White company calls the Mono-top, and the equipment also includes a motor-driven tire pump. The touring car price is $4,600.



New White limousine on the four-cylinder chassis

McCLURG ORGANIZES SUSIDIARIES

Coshocton, O., Dec. 2—The interests which took over the plant of the McClurg Rubber Co. have organized a number of corporations, among which are the Midland Tire and Rubber Co., the Ben Hur Tire and Rubber Co. and the Peerless Tire and Rubber Co. The plant, which is now in operation, will be conducted by the Midland Tire and Rubber Co. The other corporations were chartered in order to preserve the names of the Peerless and Ben Hur tires, which were formerly manufactured at the local plant. New molds have been ordered and the machinery will be increased. Many orders have been booked. Wilmer Dunbar of Greensburg, Pa., is general superintendent.

CHASE LEAVES A. C. A.

New York, Dec. 5—Special telegram—Herbert Chase, for years laboratory engineer of the Automobile Club of America, has resigned to become assistant secretary of the S. A. E. under Coker F. Clarkon.

OLDS SHOWN IN DRUG EXHIBIT

Chicago, Dec. 2—A new field for motor car exhibits has been uncovered by the Olds Motor Works, which has entered a complete showing of its cars in the National Food, Drug and Chemical Exposition, at the Coliseum, December 2 to 10, inclusive.

The move is the result of realizing that the motor car is just as important and as much a part of a physician's equipment as his medical case or his instruments. Physicans attend drug shows to witness, in concrete form, the latest advances in everything pertaining to their profession, so why not motor cars?

Elaborate arrangements have been made by the Olds Motor Works to secure the attendance of physicians at the Chicago show, special invitations with admission tickets being distributed to several thousands of them in Chicago and vicinity.

It is believed that not only physicians but members of many allied professions will take great interest in the Oldsmobile Chicago drug show exhibit, the idea of exhibiting motor cars at a drug show being entirely new and novel and calculated to stimulate the interest of progressive men.

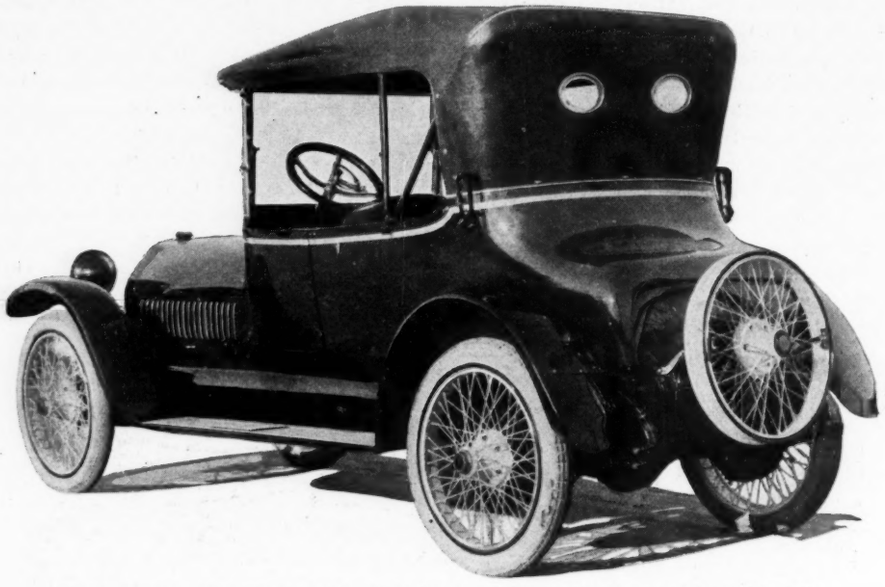
The feature of the Olds Motor Works exhibit at Chicago, of course, is models especially adapted for physicians' use. The concern has for some time been building a roadster which is peculiarly suited to physicians' purposes.

Distinctive Finish on New Studebakers

Changes Confined to Details to Improve Appearance, Comfort and Flexibility

BETTER finish, better equipment and refined mechanical characteristics without radical changes appear in the 1917 Studebaker fours and sixes at a price increase of $130 on the six touring car and $55 on the four. These seven-passengers now sell for $1,180 and $940, respectively.

Gunmetal finish of gray with black fenders is the most striking addition to the appearance of the cars. The bodies are otherwise much improved, noticeably in the design of the auxiliary seats, upon which there is a patent pending. The chairs are large and well upholstered, with comfortable arm rests which fold entirely out of sight under the rear seats, converting the car into a five-passenger model, to all appearances. Another new feature in the matter of seating is found in the reversible front seat. The passenger beside the driver may face forward or backward at will. Both front seats are adjustable for leg lengths and are fitted with robe straps on the rear.



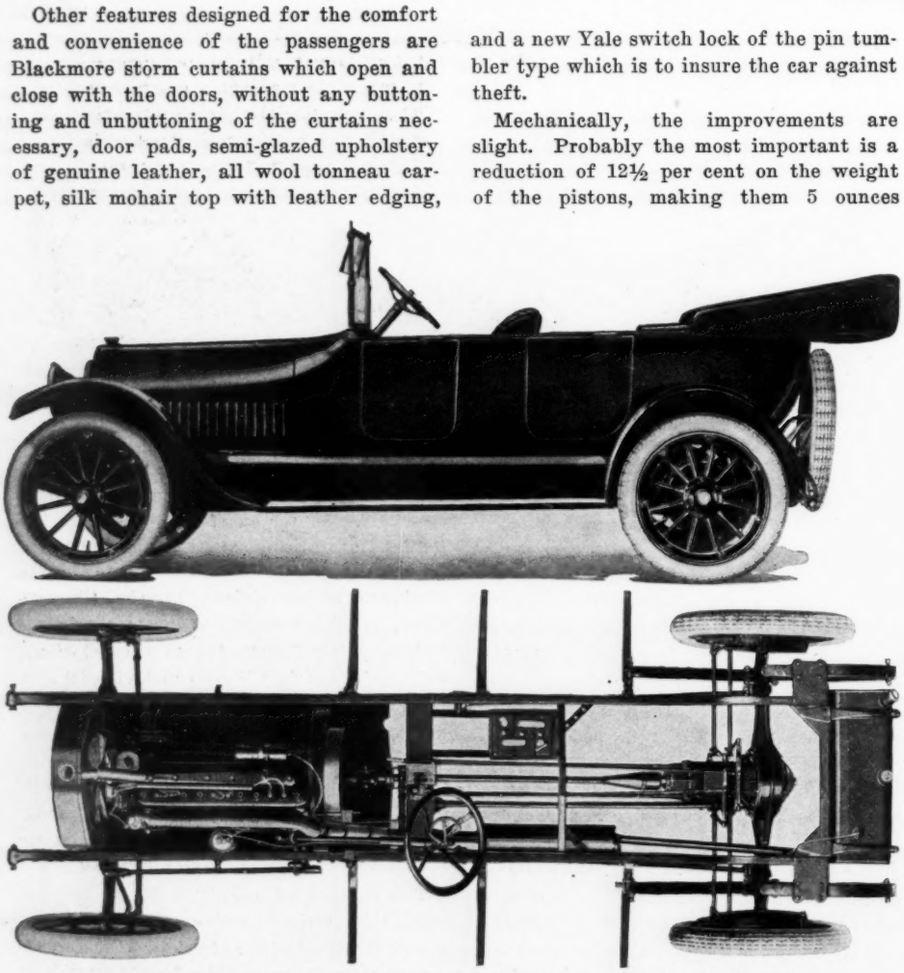
Three-quarter rear view of the Studebaker roadster fitted as special with wire-wheel equipment

Other features designed for the comfort and convenience of the passengers are Blackmore storm curtains which open and close with the doors, without any buttoning and unbuttoning of the curtains necessary, door pads, semi-glazed upholstery of genuine leather, all wool tonneau carpet, silk mohair top with leather edging, and a new Yale switch lock of the pin tumbler type which is to insure the car against theft.

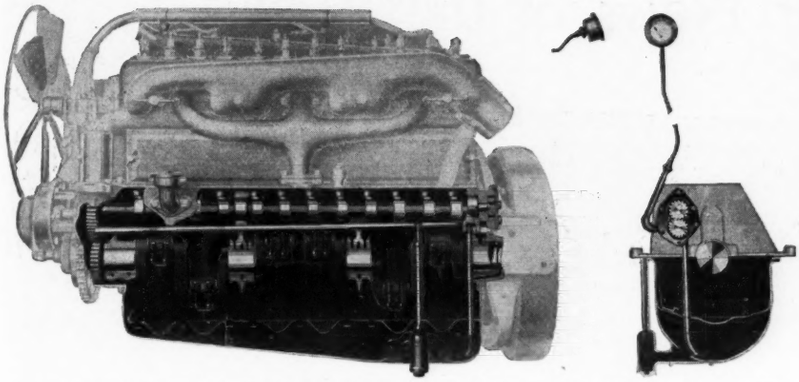
Mechanically, the improvements are slight. Probably the most important is a reduction of 12½ per cent on the weight of the pistons, making them 5 ounces lighter than in the 1916 cars. This reduction in weight has been accomplished by milling out the piston skirts.

The oil pump has been changed slightly in the way of making a tighter fitting pump which has increased its pumping ability and also removed the danger of losing time. The rear axle has been stiffened and strengthened, giving a higher factor of safety in this part, and in the electrical equipment improvements in the design have increased the cranking power of the starting motor by 12 per cent. This increase in the electric cranking effort is due to improved winding of the motor. The generator has also been improved by alterations in the wiring which give much better charging characteristics. About 3 amp. increase of current is furnished the battery at a car speed of 15 miles per hour, while the maximum charging rate has not been altered. The practical result of this change as it concerns the driver is that the slow speed operator will get better charging performance and the battery will not be injured by the faster driver. Another detailed change in the electrical equipment is in the head lamp mounting by means of which the lamp can be turned and fastened in any position.

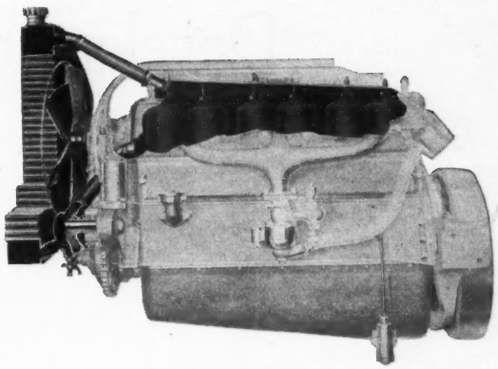
From a manufacturing standpoint, the outstanding feature of the Studebaker line is its standardization. The four and six are exactly similar in design throughout. Both motors having their cylinders cast in a single block of similar dimensions, 3⅞ by 5, and with all parts similar from one end of the chassis to the other excepting



Above—The seven-passenger standardized Studebaker six, which has a new gunmetal finish with black fenders. Below—Plan view of the series 18 six-cylinder chassis, illustrating the layout of the driving and torque members



Cut-away illustration of the Studebaker motor, showing plan of lubricating system and the camshaft suspension and drive



View of Studebaker six motor, cut away to show system of cooling. Note the large amount of water space around each cylinder

where structural dimensions differ on account of the difference in the powerplants.

Studebaker characteristics, which have been continued this year, are the rear axle gearset, cone clutch, Wagner electric lighting and starting. There is a vacuum feed from the rear tank.

No alteration has been made in the valve action. The camshaft is driven by helical gears directly from the crankshaft and the tappets are the same constant-diameter units adopted last year. These cylindrical pieces being of the same diameter at the top as they are at the bottom, can be drawn from the crankcase by simply lifting the valve and the spring out of the way.

Lubrication is by a circulating splash system with a gear pump. The oil is driven from the crankcase reservoir through a lead running the entire length of the crankcase with a duct to each of the main bearings. The oil is forced through this and the pressure under which it is being fed is registered upon a pressure gage mounted on the dash. The oil passing through the entire length of the main lead flows to the timing gears and acts as their lubricant. The overflow from the main bearings enters the splash troughs where it is picked up by the scoops on the rods.

The starting and lighting system is a two-unit outfit with the motor and generator both being mounted on the right. The generator is mounted vertically and driven from the helical gears in mesh with the crankshaft gear. The starting motor engages the crankshaft through a chain drive and is provided with an over-running clutch which releases the starter when the engine is running.

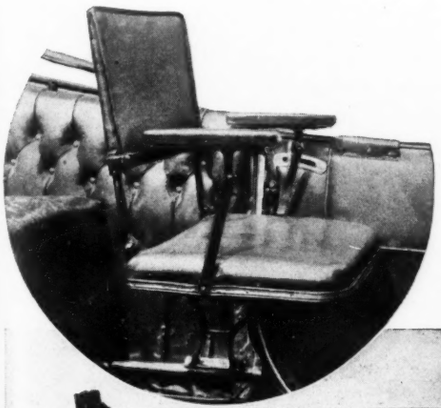
The torque exerted on the crankshaft is over 200-ft. lb, the energy being supplied by three-cell, 6-volt 100 amp. hr. Willard battery mounted under the front seat. For ignition there is a Remy coil and distributer. The headlights can be focused on any spot desired, and these, together with the dimming device, speedometer and tail lights are controlled by dash switches.

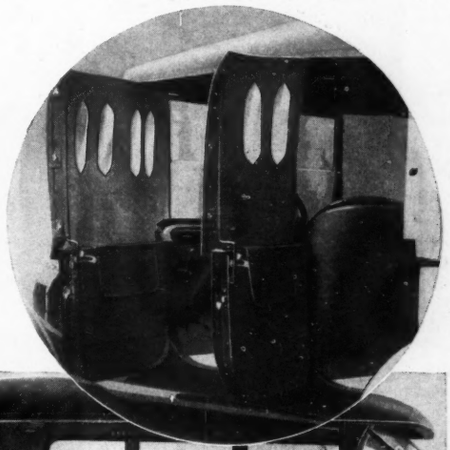
Particular attention has been given to the wiring which is a single system, grounded-return, with the wires carried in flexible metal conduits. The feature introduced last year of placing a junction box on the rear right side of the engine where it is very accessible is continued. All the wires go to this box and there are practically none on the body except to the control apparatus on the cowl. Four screws hold the cover plate on the junction box, giving access to any of the connections for

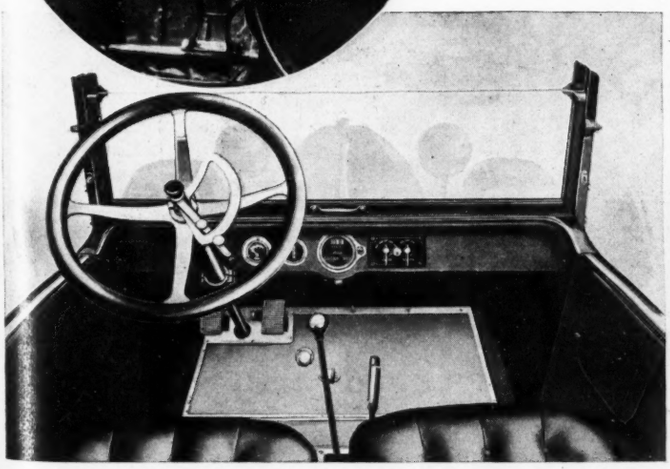
(Concluded on page 45)

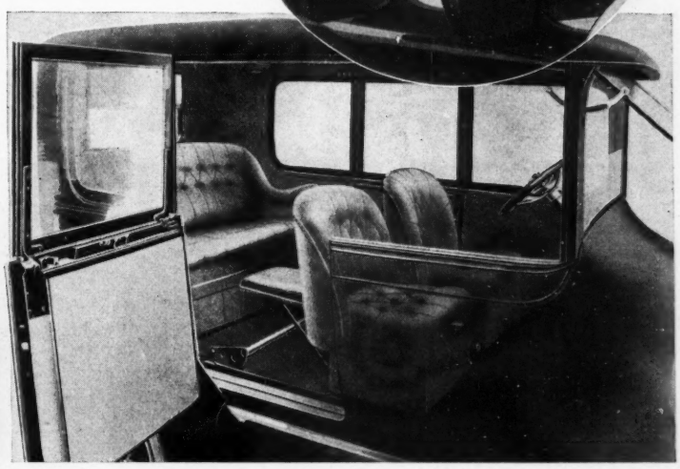
STUDEBAKER DETAILS

Top, left—Auxiliary seat opened. This folds under the rear seat, completely out of sight. Bottom, left—Control arrangement with Yale lock on the ignition switch. Upper, right—Blackmore storm curtains which operate with the doors. Lower, right—Interior arrangement of the series 18 *limousine. The front passenger seat may be revolved*

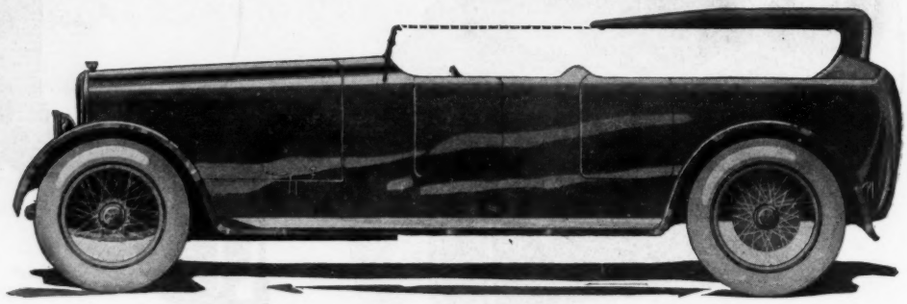




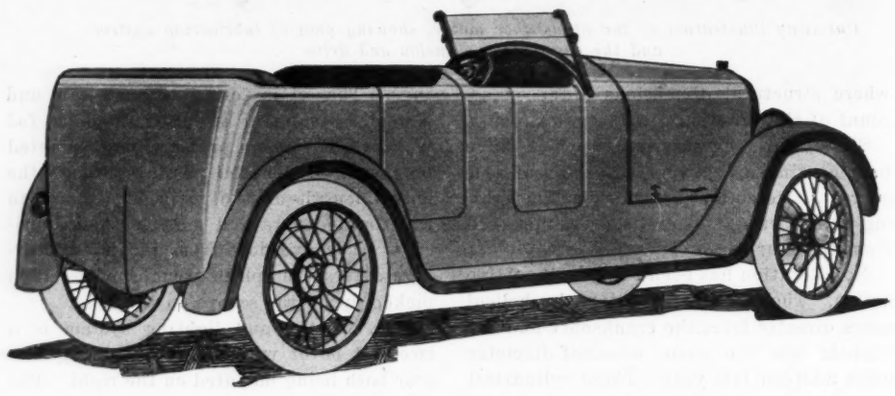




Development News of the Week



The no-man top about half unfoldcd. The entire operation of putting the top up or letting it down into its concealed position in the rear is controlled from the driver's seat



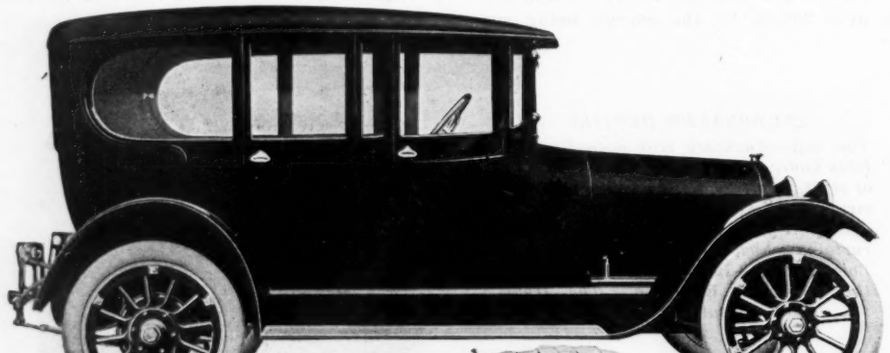
The compartment built onto the rear of the body which contains the folded top

THE no-man top, a product of the Automatic Auto Top Co., 20 East Jackson boulevard, Chicago, is entirely at the command of the operator of the car and may be handled easily from the driver's seat. The release of an auxiliary clutch and the engagement of one set of gears, claimed to be a matter of but 10 seconds, completes the operation.

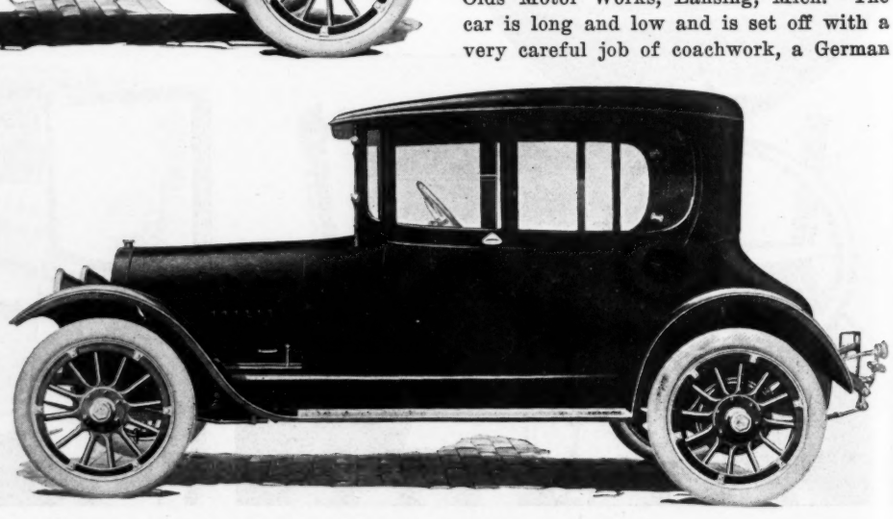
The operator throws out an auxiliary clutch which automatically releases a cover at the rear of the body, which is held in place by spiral springs. This cap conceals the top, wound on a large wooden roller. At the same time two $\frac{1}{16}$-in. cables appear, one on either side of the body. These the operator attaches to the cable at the side of the windshield. At the same time the back supports of the top are presented and made firm by spiral springs.

The operator now engages the gears through the gear lever and clutch. The cables through the windshield standard are drawn down and wound onto spools placed on an auxiliary shaft running crosswise of the car. The main shaft, running lengthwise of the car, is placed in operation and connects with the roller in the top casing. This roller is set in motion, and the two operations draw the cover to the windshield, where it is clamped in position by fasteners of special design.

The top is supported and kept in position by three lines of spring steel, one on either edge and one in the center fabric. It is further supported by an upright which can be raised when desired from the center of the body. To return the cover to its housing the action is reversed.

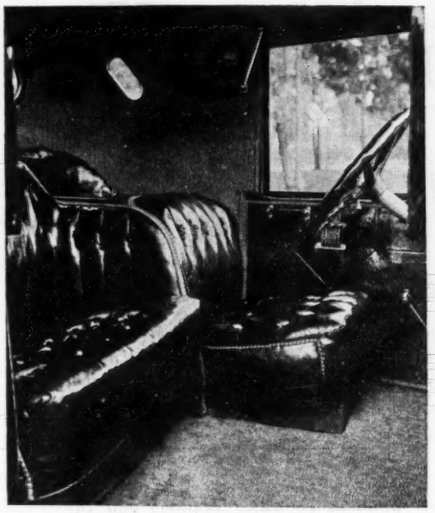


Auburn has brought out two new inclosed models. The sedan pictured above has two doors entering into the rear compartment with access to the front compartment through divided front seats. The four-passenger model shown at the right has entry into the front compartment with access to the rear through the divided seats. Both bodies are of the convertible type

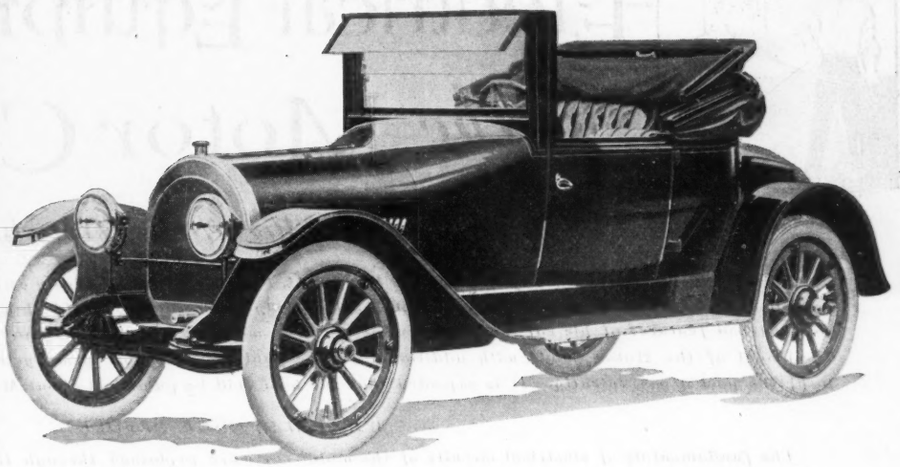


COLLAPSIBLE TOP OLDSMOBILE

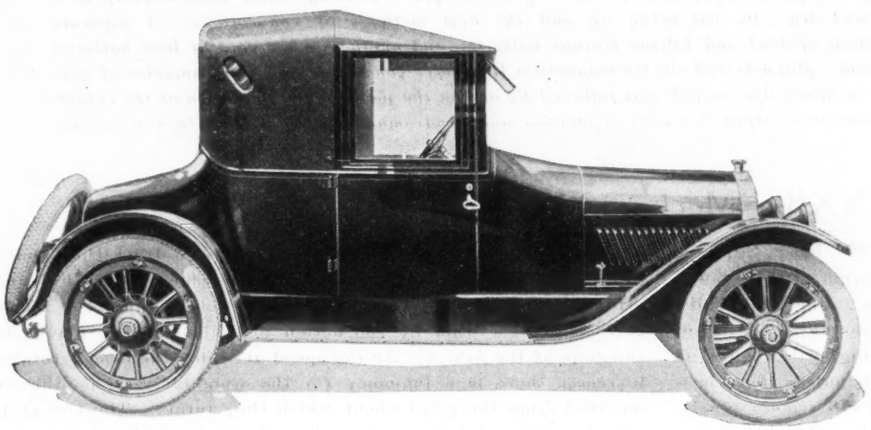
A collapsible top entirely free from exterior bracing characterizes the completely appointed cabriolet just added to the line of eight-cylinder cars produced by the Olds Motor Works, Lansing, Mich. The car is long and low and is set off with a very careful job of coachwork, a German



Interior of the Oldsmobile four-passenger collapsible-top cabriolet



Oldsmobile's latest offering is a four-passenger cabriolet on the eight-cylinder chassis. The collapsible top is entirely free from exterior bracing



As the Oldsmobile cabriolet appears with top up and windows closed against the weather

silver radiator and silver finished lamps, hub caps and door handles.

The top, because of its lack of exterior bracing, presents a clean, smooth appearance. It may easily be handled from the inside by one man. When it is raised the front is rigidly locked to posts integral with the body. When it is lowered, because of a toggle joint arrangement, it is locked in place eliminating the need of exterior fastenings. The top material is of black landau leather.

Windows May Be Lowered

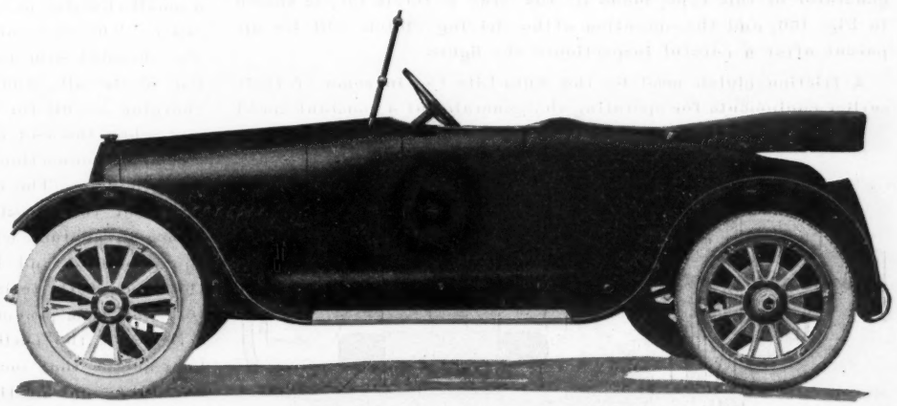
The windows may be lowered to any desired amount. When the top is lowered these windows drop into a recess inside the doors and are entirely concealed. The street door is locked from the inside while the door on the curb is fastened with a Yale lock.

The seats are staggard with the forward one for the driver, and the rear one large enough to comfortably seat two passengers. In addition there is an extra seat for a fourth pasenger pivoted under the cowl. The extra space behind the driver's seat contains a leather covered compartment 14 in. square and 21 in. deep. The interior is finished with upholstery of long grain French leather over coil springs and curled hair, and a top lining of heavy, striped gray wool.

The color is dark azure blue and wheels of hickory in natural wood finish. The price is $1,775, f. o. b. Lansing, Mich.

DOLLY MADISON FOUR PASSENGER

A four-passenger roadster has just been announced by the Madison Motors Corp., Anderson, Ind., on the 120-in. wheelbase chassis. The addition of this new Dolly Madison makes five models in the present series, all six cylinder, with a range in price of $1,050 to $1,250, the latest model selling for $1,150. Mouse gray with red wheels and black fenders is the color scheme of the new four passenger. Specifications include a Rutenber 3⅛ by 5 motor, Remy electric system, full floating axle and 34 by 4 tires.



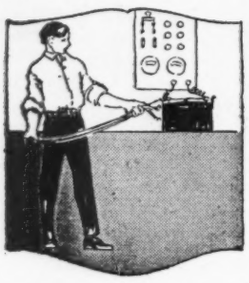
The Madison Motors Corp. now announces its fifth model in its present series of cars in the form of a four-passenger roadster selling for $1,150 f. o. b. Anderson, Ind.

OPENS BRANCH AT NEW YORK

Springfield, Mass., Dec. 2—The Springfield Body Co. has opened a branch at New York. Charles Baasch will be in charge.

SELLS CAR BY PHONE

St. Louis, Mo., Dec. 2—The easiest sale reported here in a long time comes from the Velie Automobile Co. and disposed of a Biltwel six closed car. The first known of the prospect was when a woman called by long distance telephone. The woman purchaser told the salesman that she had ridden in a neighbor's car and liked it and that her husband had told her the Velie was all right, so if they would send a car to her home she would buy it. The deal was entirely closed in 4 hours.



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the twenty-third installment of a weekly series of articles which began in Motor Age issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently. It is expected that the book will be published about May 1.

WHAT HAS GONE BEFORE

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems and the relations of current pressure and resistance brought out. This was followed by an explanation of series and multiple circuits, and how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was taken up and the best methods of connections. A separate section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and best methods of charging them. Magnets and electro-magnetism then were considered and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. The first two methods of regulating the generator output, inherent regulation and electromagnetic regulation, then were considered.

Part XXIII—Mechanical Regulation

GENERATOR Operated at a Constant Speed by a Slipping Clutch Controlled by a Centrifugal Governor: If a shunt generator be operated at a constant speed, the voltage will build up to a definite value and remain practically constant. The value of this definite voltage can be adjusted by changing the value of the resistance of the shunt field winding and, unless there is a change in the speed or resistance of the field, will remain practically constant so long as there is no change in the value of the current the generator is delivering. The regulation of a number of different systems put on the market by the Gray & Davis Co. is accomplished in this manner. In the systems a series field winding usually is provided. This series field is arranged to carry all or a certain part of the current delivered by the generator, and its magnetizing action assists the magnetizing action of the shunt field and causes an increase in the value of the field strength with an increase in current delivered and, hence, an increase in generated voltage with an increase in the current output. The magnetizing action of this series field is usually adjusted so that the increase in generated voltage is just enough to counteract any loss in the armature and connecting leads, due to the increased output which results in the voltage at the terminals remaining fairly constant for all loads. The cross-section of a generator of this type, made by the Gray & Davis Co., is shown in Fig. 156, and the operation ofthe driving clutch will be apparent after a careful inspectionof the figure.

A friction clutch used by the Auto-Lite Co. in some of their earlier equipments for operating the generator at a constant speed is shown in Fig. 157. The governor consists of a drum, D, fastened to the driving shaft and of two friction shoes, B, each being attached to a weight, W, and normally held against the inside surface of the drum by the action of coiled springs placed in the ends of the arm A. As the speed at which the arm A rotates increases there is a tendency for the weights W to be thrown outward from the point about which they rotate. The two arms carrying the weights are pivoted at the ends of the arm A, and as the weights are thrown outward the action of the springs holding the friction shoes against the cylinder is decreased. The speed at which the clutch slips may be changed by moving the weights W toward or away from the points at which the arms carrying them are pivoted. The nearer the weights are to these points the higher the speed necessary for the clutch to slip, and likewise, the farther these weights are away from these points the lower the speed necessary for the clutch to slip.

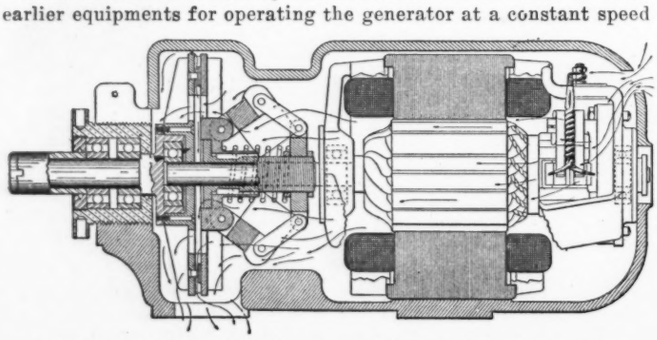


Fig. 156—A slipping clutch operates this Gray & Davis generator

Regulation by Centrifugal Governor

Centrifugal Governor Used in Inserting Resistance in the Charging Circuit: A good example of this type of regulation is found in a machine manufactured by the Vesta Co. In this machine the position of a rheostat arm on the contact segments of a small rheostat is controlled by the action of a centrifugal governor. The end contact of the rheostat, on which the end of the rheostat arm rests normally and at low engine speeds, is not electrically connected to any of the other circuits. The charging circuit for the battery is connected to the rheostat arm, and when the end of the arm is on this insulated segment the electrical connection between the generator and the battery is not complete. The end of the arm travels over the contact segments of the rheostat with an increase in speed, and when it comes in contact with the second point the circuit connecting the generator and battery is closed. A further movement of the arm inserts resistance in series with the generator and battery and thus prevents an excessive charging current.

Some of the earlier Delco systems made use of an ampere-hour meter that measured the quantity of electricity put into and taken out of the battery and gave an indication of these quantities on a suitable dial. The pointer on the indicating dial of this instrument travels in one direction when the battery is

charging and in the opposite direction when the battery is discharging. The difference in the indications of this pointer at two different times is a measure of the net quantity of electricity put in or drawn from the battery during the interval between taking the two readings. A double set of contacts is carried in the containing case of the instrument, through which the field current of the generator must pass. A movement of the pointer of the meter past a certain position causes one set of these contacts to open and, with further movement past this point in the same direction, causes the second set of contacts to separate. When the first set of contacts is opened a resistance is inserted in series with the field and the charging current is reduced. When the second set of contacts opens the field circuit is opened altogether, and the charging of the battery is practically stopped, as there is no field, except that due to residual magnetism, for the armature of the generator to revolve in. The reverse operation of these contacts takes place when the battery discharges and the pointer is turned in the opposite direction. With this system the rate at which the battery is charged is governed by the amount of charge in the battery. The hand on the meter must be moved in the direction of charge at certain intervals, because there must always be a greater number of ampere-hours put into the battery than it can supply. The meter hand is mounted in such a way that this adjustment easily may be made.

Suggestions in Adjustment of Regulators

The adjustment of the regulator equipment on the different cars is made by the manufacturers of the equipment or at the factory where the equipment is installed and is correct for that particular make and model of car under ordinary conditions. Under no conditions should this adjustment be changed unless the person making the change is positive that such a change is required, and even then it is best to have an experienced man make the adjustment, as more damage may be done than good. Difficulties arising from improper change in the adjustment of the regulator may not be apparent at the time the change is made, and the car may run for a considerable period before there is definite evidence of the difficulty. In the majority of cases low generator output is due to improper care of the commutator and brushes, in not keeping all the various electrical connections clean and tight or in not giving the battery the necessary attention.

Occecasionally unusual conditions may arise in the operation of the car, which will demand an increase in the generator output. For example, the addition of extra electrical equipment may necessitate an increase in the rate at which the battery is charged for a given speed of the car. It is always advisable to make sure that you are not demanding a larger output from the battery than it is capable of handling under ordinary conditions, as permanent damage to the electrical equipment will be the ultimate result. In some cases a car may be driven a great deal more at night than in the daytime, and with the lamps lighted the demands on the battery will be increased. Under these conditions it is necessary to increase the rate at which the generator will charge the battery for a given engine speed. Owing to the lower efficiency of the battery in the winter and the greater use of the lamps, the charging rate of the generator should, as a rule, be increased. It may be advisable to lower the charging rate of the generator or to stop the charging operation altogether on a long drive by disconnecting the generator, short-circuiting it or removing the field fuse, depending on the kind of generator and the method of regulating its output. In some cases a special switch, called the touring switch, is provided. This produces the necessary changes in connection when it is turned to the position that causes a reduction in generator output.

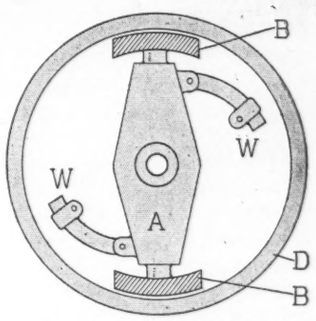


Fig. 157—This Auto-Lite friction clutch also tends to maintain a constant speed

NEXT WEEK

The next installment of the series on Electrical Equipment of the Motor Car will take up the subject of Electric Motors

Distinctive Finish on New Studebakers

(Continued from page 41)

the entire system. When the body is removed from the chassis there is no need to make a number of disconnections and furthermore the connections should not work loose as they are all very rigid. The entire system operates at 6 volts.

There are two radius rods which are attached to the side members of the frame with flexible connections to allow for rear spring action, while preserving the alignment of the rear axle. A gear reduction at the axle of 4 to 1 on the four and 3.7 to 1 on the six is employed. The three-quarter elliptic spring suspension adopted last year has been continued, the rear springs being underslung beneath the axle. On both cars they are 51 inches in length with 38-inch front springs.

On account of the greater motor length there would naturally be a longer wheelbase on the six than on the four. There is 10 inches difference in this respect, the six having 102 and the four 112 inches. The tire equipment is 34 by 4 straight side on both cars. Nonskid safety treads are furnished in the rear, while each car is provided with a tire carrier at the rear of the body together with an extra demountable rim. The wheels are artillery type, covered by heavy pressed steel crowned fenders with clear running board covered with corrugated rolled aluminum. The brakes operate on a 15-inch drum with the service brake having a 2-inch face width and being a contracting type. The hand brake is expanding and has a 1¾-inch base width.

The body line is complete on both the four- and six-cylinder chassis. The cars now listed include the following:

Four Cylinder Models—Chassis alone, $850; roadster, $930; touring car, $940; Every-Weather car, $1,140; landau roadster, $1,150.

Six Cylinder Models — Chassis alone, $1,090; roadster, $1,170; touring car, $1,180; landau roadster, $1,350; Every-Weather car, $1,380; touring sedan, $1,700; coupe, $1,750; limousine, $2,600.

Complete equipment is included in the purchase price which in all cases is f. o. b. Detroit. The upholstery in the touring and roadster models is straight-grained leather, while the sedan, limousine and coupe can be finished in many different shades and patterns with bedford cord and cloth upholstering. The side seats, and back are finished in the same quality and workmanship as the cushions. In the sedan, limousine and coupe the carpet matches the upholstering. The front seats are divided and shaped to fit the back.

One of the features of the equipment is the windshield, which is a special adjustable type designed to fit snugly to the body. There is an overlapping portion of the upper glass which shuts out rain and snow. The steering wheel is 18 inches in diameter, and some of the additional equipment includes the leather-covered instrument board, Stewart-Warner magnetic speedometer, battery indicator, oil pressure gauge, carbureter control, gasoline gauge on rear tank, Yale switch lock, Sparton horn and complete set of tools.

The Readers' Clearing House

What Is Wrong with Racing?

INDIANAPOLIS, Ind.—Editor Motor Age—The recent articles in Motor Age on "What Is Wrong With Racing?" seem to be arousing considerable interest throughout the motor-interested public and I take this opportunity to express my view on the subject.

Something is wrong with racing, there is no doubt of that, and it seems the box office receipts of several recent meets tell this undeniably. In my belief it is this: The racing game today is very much like the theatrical busniess, it is a question of what the people desire to see. There is no doubt the super-developed speed creations of the day give the public wonderful speed exhibitions and now and then some thrills, but is this what people want, or do they want something nearer true to the ordinary, something nearer home? I think that they all appreciate the fact that they are seeing something wonderful in the way of speed, but they also appreciate the fact that the Maxwell on the track is nothing like the one they buy and that if they could buy a Peugeot it would not be of the same design and material as the one speeding before them.

This fact acts as a damper on public interest. The people want to see, not truly stock car racing, but races between cars built of the same materials and of the same design as that which they buy for everyday use. They would be interested in handicap races, the cars being handicapped according to performance, like horse races. In the day when Fords, Buicks, Coles, Alcos and others met in contest, every car owner was a race goer and when that day dawns again, then the public will return to racing and not until then.

Then again the public is beginning to learn that practically all the really fast cars are owned and controlled by three or four men and they look, in a way, on the big events as a sort of hippodrome affair.

I witnessed several races held on half-mile tracks this summer and I never have seen such enthusiasm displayed in speedway races as there was at any one of them. Each driver was driving as if his life depended on his winning the two hundred dollar prize and some very clever driving there was too. The speed that they had doped their cars up to do was also surprising. Among them were Overlands, Fords, Chevrolets, Buicks and the ordinary run of low-priced cars.

Now I do not own a speedway, but I am interested in racing and I am living in hope that other speedways will follow the example set by the Chicago track and encourage small car and near stock racing. I am sure that in this event, those who have seemingly lost interest in the racing game will lose no time in returning.—A. A. Lease.

BATTERY CHARGING IN IDLE CAR

Engine Should Be Run Twice a Month and Hydrometer Readings Taken

Walterville, Ore.—Editor Motor Age—I am putting my Dodge car up for the winter. How often and how long each time should the motor be run to keep the battery charged fully, or nearly so? The battery is a Willard 6-cell, 12-volt.

2—Explain how to connect a trouble lamp to a Dodge car. Will the battery take care of this?

3—Give the address of the Reo Motor Car Co. —Herbert Smeed.

1—The motor should be run twice a month for an hour or more at charging speed. You should test the battery with a hydrometer after each running to ascertain if the battery is fully charged. If it proves to be too far down, of course the motor should be run again until the proper charge is given.

2—The trouble lamp may be connected to the two battery wires providing the trouble lamp is fitted with a 12-volt bulb.

3—Reo Motor Car Co., Lansing, Mich.

ATTACHING SPARK PLUG TERMINAL

Diagram Explains How Work Should Be Done to Give Results

Lost Creek, W. Va.—Editor Motor Age—Please publish a diagram of the correct method of attaching the cable terminal to the cable at the spark plug.

2—Give the method of re-magnetizing magnets.

3—Does Motor Age answer personal questions by mail?—W. G. Adams.

1—Cable terminals come in varieties of shapes and designs. A method of connecting one of the commonly used types is shown in Fig. 2. The wire should be bared about an inch from the end and the extreme end of the wire frayed back for about ¼ in. Then the insertion should be made with the wire through the hole and the insulation inserted into the shell of the terminal as shown. The frayed ends of the wire should be flattened out on to the bottom surface of the terminal and then soldered firmly.

2—A remagnetizing magnet is described on page 29 in the November 30 issue of Motor Age.

3—Yes.

MAKING A FORD FAST

There has recently been a surprising amount of interest manifested in the reconstruction of Ford cars for purposes of speed. The interest came as a wave directly after the Ford amateur races on the Chicago speedway and was undoubtedly promulgated by the country-wide interest that was shown in that event. Inquirers in constantly increasing numbers appeal to Motor Age for information on how to do this and that to make their Ford cars go faster.

Motor Age now sends out an appeal to those who have reconstructed their Fords satisfactorily to send in illustrations and a complete description of just how the alterations were made.

Tell us:

How much it cost. Itemizing what you can.

How much of the work did you do yourself?

How fast has the reconstructed car traveled?

Where did you buy whatever new parts you used?

Is your car good for speed only, or do you also find it possible to drive it for pleasure purposes?

If enough replies come in, with suitable illustrations Motor Age will endeavor to devote several pages of an issue in the near future using the interesting photos and the correspondents' descriptions under their own names.

If a man has reconstructed a Ford to develop 65 or 70 miles per hour Motor Age readers want to know about it.

REBUILDING 1912 FORD FOR SPEED

Cannot Repair Scored Cylinders by Inserting Graphite

E. St. Louis, Ill.—Editor Motor Age—I am rebuilding a 1912 Ford into a speedster and would like some advice concerning a few problems with which I am confronted.

Two of the cylinders are slightly scored, the worst one, possibly in two or three places, and the deepest, not more than $\frac{1}{32}$ inch deep and $\frac{1}{16}$ inch wide, apparently from a loose wristpin. Could this be remedied by feeding the motor flake graphite, and how should it be fed so that the graphite will fill the scores?

2—I have an Atwater Kent ignition system. What is the best place to set the spark? Also the best timing of the valves?

3—Give instructions in regard to measurements of the piston travel, not by degrees of travel of the crankshaft.

4—I would like to use faster gears. Which would give the best service, that is, which is the highest gearing I can use, and get full efficiency from the engine, considering, of course, that everything is working in an average condition, compression and everything good. Ratios 3-1, 2¾-1, 2 4/7-1?

5—Give illustration showing as nearly as possible the best method of drilling pistons so as to lighten them. I want them drilled as much as I can without weakening them to the extent that there would be danger of breaking under service. Also, could the connecting rods be drilled to any advantage? Kindly show size of holes, and the best location.

6—Show the method of wiring an Atwater Kent ignition system to the Ford.

7—What is the proper method of lining up wheels both front and rear? I am going to line the wheels up with the tires off, so would like the measurement using the rims as a basis.

8—I am considering rebuilding the radiator. Am going to remove two tubes from each side and build the water tank about 3 inches higher, if necessary and a large tank inside. Would the tubular radiator take care of the cooling of the water after reducing the cooling surface as must be done, or would a larger surface honeycomb radiator be necessary?

9—Advise the method of adjusting the transmission. Would this adjustment be so delicate that you would advise me having an experienced mechanic doing this? The machine is to be underslung with streamline body and to be used for city driving as well as for speed. I want it to work satisfactorily for both without any extreme adjustment.—Okey Miller.

1—Graphite is not a remedy for badly scored cylinders. The cylinders have become scored by the action of the pins, and probably the pistons operate into the scored portions and a soft mixture such as graphite would be dug out as quick as it would work in. There is a process of introducing an alloy into the scored portions which is said to be satisfactory. You would do well to replace the block or have the cylinders rebored and fitted with new pistons.

2—The spark timing adjustment for high speed is a matter of experiment. Set the timing ahead a notch at a time and give it all it will take, that is until the motor will just fire well without knocking with the spark retarded and the throttle closed. The conventional valve setting is satisfactory for high speed work. No need of changing that.

3—To find the average piston speed in feet per minute, knowing the stroke and the revolutions per minute of the motor, use the following formula:

$$\text{Feet per minute} = \frac{\text{r.p.m. times stroke}}{6}$$

4—The 2¾ to 1 ratio would be about as low as you could use unless you were planning on speedway work. Remember that racing cars are geared around 2¾ to 1 and 3 to 1.

5—Ford pistons are about as light as consistent with any factor of safety. We would advocate the use of aluminum alloy pistons for lightness. It is not recommended that the connecting rods be drilled either. Do not take the risk of ruining your motor with a fractured piston or connecting rod to give you 2 or 3 miles more speed.

6 — The Atwater-Kent system is described and illustrated in the article beginning on page 24 in this issue.

Communications Received and Inquiries Answered

A. A. Lease.....Indianapolis, Ind.
Herbert Smeed.....Walterville, Ore.
W. G. Adams.....Lost Creek, W. Va.
Okey Miller.....East St. Louis, Mo.
Charles Hart.....Dallas, Tex.
Ray Van Bibber.....Orange, Cal.
Harry Schmidt.....Lakewood, O.
H. D. Gade.....New Braunfels, Tex.
T. M. White.....Atlanta, Ga.
C. E. Geiger.....Redding, Ia.

No communication not signed by the inquirer's full name and address will be answered in this department.

7—The lining of Ford wheels front and rear is a very easy matter. Procure a straight edge, probably a board, long enough to extend from the back of the rear wheel rim to the front of the front wheel rim. Then place the straight edge against the rear wheel rim, slightly above or below the center so that it reaches across the front wheel. The straight edge should lie flat across both faces of both rims. Then, with the front wheels at the same setting, move to the other side of the car and repeat the measurement. There should be a space between the straight edge and the front of the front rim about ⅜ or ½ inch. If the wheels are not so set they should be adjusted so that they will "toe in" the amount stated.

8—A standard radiator with a tank built on to carry about 2 quarts more of water, is enough to take care of the cooling at any speed. The extra tank may either be soldered onto the front or the back of the top water compartment of the radiator. To have a neat looking job why not solder a V-shaped copper tank onto the top front of the radiator?

9—The method of adjusting the Ford clutch and gearset may be found on page 30 of the November 16 issue of Motor Age. It is a simple matter of turning up set screws provided for the purpose.

Motor Age readers would undoubtedly appreciate it if you would forward photographs of your completed machine with a description, this to be published in these columns. Read the story in the center of page 46.

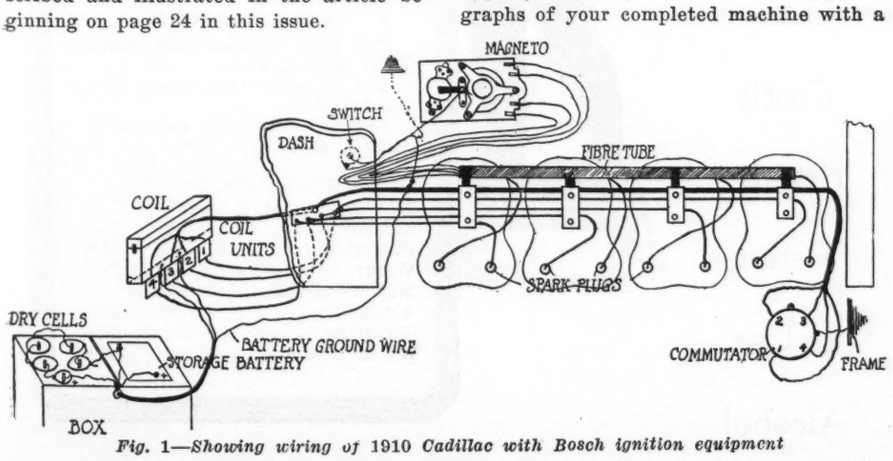


Fig. 1—Showing wiring of 1910 Cadillac with Bosch ignition equipment

HIS FRANKLIN MOTOR OVERHEATS

There Must Exist an Improper Adjustment to Cause Such Trouble

Dallas, Tex.—Editor Motor Age—I have a 1914 Franklin 6-30 which has no power after running 10 miles, as it gets very hot. I have had the valves ground and Lewis rings put in, but the engine will not pull when it gets hot. The timing is O. K., the magnet and carbureter have been overhauled, compression seems the same in each cylinder. Should I have the cylinder bored?—Charles Hart.

A Franklin car should not overheat any quicker than a water-cooled one. The trouble is in the adjustment. For instance, on the Franklin car, if it is allowed to run for any length of time with the needle valve too far open, the normal position being three-eighths to five-eighths of a turn, it would overheat simply because of the richness of the mixture creating imperfect combustion.

In timing the Franklin motor there should be a clearance of .008 in. between the valve walking beam adjusting screw and the valve stem. In this case this clearance is not correct, or if the clearance is less that .008 in. the result would be the partial holding open of the valves, loss of power and overheating.

According to the factory the use of nonleaking rings has no particular benefit over using the type originally inserted.

If the compression is good in each cylinder, it would be hardly practical to rebore the cylinders.

MOTOR HAS MYSTERIOUS MISS

Possibly Floating Valve in Carbureter Becomes Stuck

Orange, Cal.—Editor Motor Age—My motor, which is equipped with a Miller carbureter and Dixie high-tension magneto, free from carbon, and otherwise in good condition, misses badly at certain speeds. To state the case more clearly—starting with a cold motor and running on a fairly level road at a very moderate rate of speed, the engine performance is excellent for about a quarter of a mile, when the motor will begin to miss. This miss becomes more general if the throttle is opened, but if it is quickly closed and the motor nursed carefully, it will hit very well until the motor again reaches a speed of 15 miles per hour. From this point up to 25 or 30 the motor struggles along on three cylinders, when, after the missing cylinder has finally fired a few intermittent shots, it will settle into a perfect stride, and if run at this rate of speed for a few minutes it will give no further trouble at any speed. However, after a long, hard pull at about 5 miles an hour on high, as over a bit of rough, soft road, a similar condition results. The motor will make the pull beautifully, but when it is accelerated after the pull, it immediately misses in one or more cylinders and continues to do so until considerable speed is attained, when it again fires perfectly. Although a number of mechanics have endeavored to find the cause of the trouble, none has succeeded thus far, and I shall appreciate it if you can throw any light on the matter.

2—Will you kindly explain the method of measuring grades. What per cent grade is a 30-degree angle?

3—Are S. G. V. cars being manufactured at the present time? If so, kindly give the address of the manufacturer.—Ray Van Bibber.

Although it is quite impossible to diagnose such a trouble accurately by correspondence, if we had a car which acted the same way we would look to the car-

bureter for the source of the trouble. In the Miller carbureter we would suppose that such a trouble could develop if the rising and falling cylinder which opens and closes the ports was either jammed or dirty so that it became stuck at certain times. You might disassemble the carbureter and examine this part. If you cannot get rid of the trouble yourself it is our suggestion that you describe the symptoms as you have to us to the carbureter maker.

2 — A 100 percent grade is a 90 degree angle. In other words a right angle is considered a 100 percent grade—straight up and down. To find the percent grade in a 60 deg. angle, a simple proportion may be used:

$$\frac{100}{90} = \frac{P}{50}$$

P is the per cent grade which is 55.55.

INFORMATION ON KEETON MODELS

Made Own Motors—Burman's Car of This Make a Special

Lakewood, O.—Editor Motor Age—What motor was used in the 1914 six-cylinder Keeton?
2—How long did the Keeton people make cars?
3—What was the price of the 1914 Keeton, and where replacements may be procured?
3—What causes this motor to overheat? After running 10 miles the water boils? The pump is all right.
5—The car runs smoothly in third speed, but on fourth speed there is some noise. Can this be avoided?
6—What type of Keeton car did Bob Burman drive, that is, the motor? What was the speed of the car?—Harry Schmidt.

1—The motor was made in the Keeton shops.

2—1913, 1914 and 1915.

3—Roadster and touring car $3,250, coupe $3,500, limousine $3,975. Carnation Car Co., Detroit, Mich.

4—Too much carbon, needle valve too far open, valves too loosely adjusted, missing cylinders, etc.

5—Probably the noise is in the gearset gearing. If the gears are worn the noise can be done away with by replacing them. Possibly the bearings which support the gearset shafts are worn.

6—Burman drove a special car built in the Keeton shops. The motor was a product of the Keeton shops. It was capable of a speed around 103 miles per hour.

MARATHON NOISY IN HIGH GEAR

If Gears Are Not Worn and Bearings Are Tight Trouble Is Cutting

New Braunfels, Tex.—Editor Motor Age—I have a Marathon model W No. 5206, 1913 or 1914 model. When the car is run below 10 m. p. h. there is an annoying gear noise, but only on the high gear—third speed direct. I have examined the teeth, but found them in good condition. Have looked for loose bearings by shaking, but decided there were no worn gear bearings.
2—What speed will this car travel under best conditions?
3—How could an ammeter be installed in the dash board? The car has a Jesco starter, single unit system, but is not wired exactly as shown in Motor Age for the Cutting 40, the Marathon having two wires from each lamp to the controller. Side lamps between are connected lamp to lamp across the dash, then one wire from each side lamp to controller.
4—The starter does not turn the engine over as fast as I can spin the engine by hand. Should it be so?
5—Starters turn the engine over jerky.

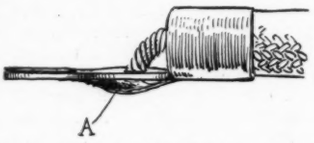


Fig. 2—Method of fastening wire into spark-plug terminal. The frayed wire should be soldered at A

Should it turn it over smoothly without jerking? However, the starter starts the engine every time and I have had no trouble so far.—H. D. Gade.

1—If the noise is in the one speed only it is undoubtedly in the high gears. If the gears are not worn or pitted and the bearings are tight and the gears mesh properly the trouble is in the cutting of the gears and the car has probably made the noise. If the noise has developed since the car has been in your possession then the gears have become worn down or there is something loose. There could be no other causes, if you are sure the noise is evident in this one speed only.

2—There is no official data on the speed of this car.

3—With the single-unit system such as the one on your car it is impossible to connect an ammeter satisfactorily, inasmuch as the current from the battery to the starter and to the lights passes through a single wire. If an ammeter were installed on this wire the starting load would register and this is necessarily so high that the ammeter would be ruined.

4—Not if the motor starts without difficulty.

5—The jerk is caused by the starter overcoming compression. If the starter works satisfactory why worry about whether it jerks on compression?

SPEEDING UP A FORD CAR

Readers Desires Advice on Whether Change Would Be Advisable

Atlanta, Ga.—Editor Motor Age—I am contemplating making some changes in my Ford car, and would like to have the following information:
1—Would putting on Atwater Kent ignition, Stromberg carbureter, aluminum pistons, and planing down the head and enlarging the valves, increase the speed to any great extent?
2—How much would Motor Age advise planing down the head and enlarging the valves?
3—Where can I obtain oversize valves, preferably tungsten?
4—With the above changes, could the bevel gears be changed to 4 to 1 and still get 40 to 45 miles per hour?—F. M. White.

1—The sum of the alterations you suggest would probably result in a faster car, with one exception. Motor Age does not advocate planing down the cylinder head. The speed, if increased at all, would not be increased enough to pay for the operation of cutting down the head.

2—Answered in question 1.

3—From a motor car supply house.

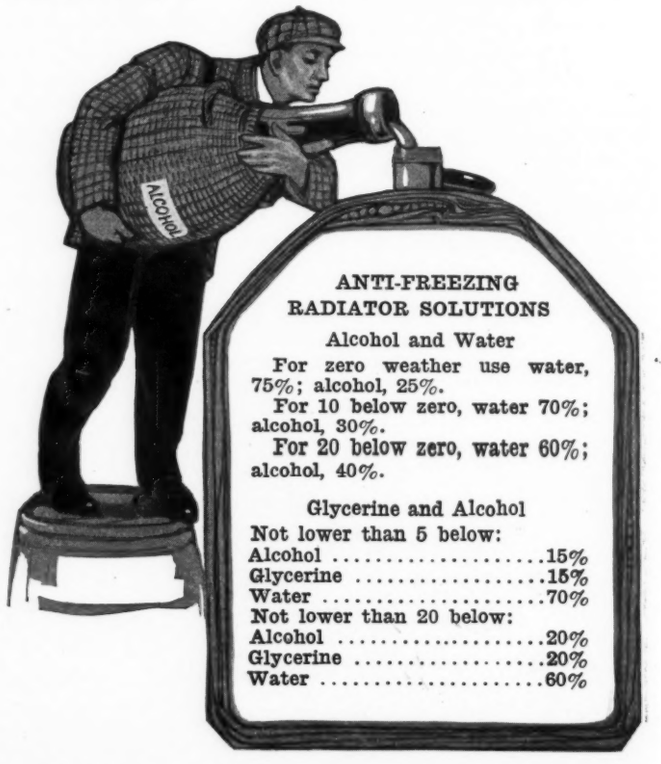
4—This is a matter upon which we could not pass judgment. It is quite probable, however, that over 40 miles per hour would be a possibility.

Wiring of 1910 Cadillac

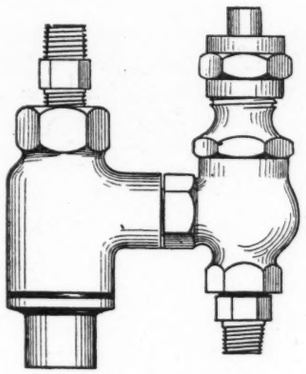
Redding, Ia.—Editor Motor Age—Give a diagram showing the wiring of the ignition on the 1910 Cadillac. It has two systems of ignition. —C. E. Geiger.

A wiring diagram showing Bosch equipment is given in Fig. 1. The Splitdorf was also put out in this model.

Cracked Water Jackets Cause Costly Repairs Better to Use Alcohol



The Accessory Corner



Carbon decomposer which mixes steam with the explosive charge

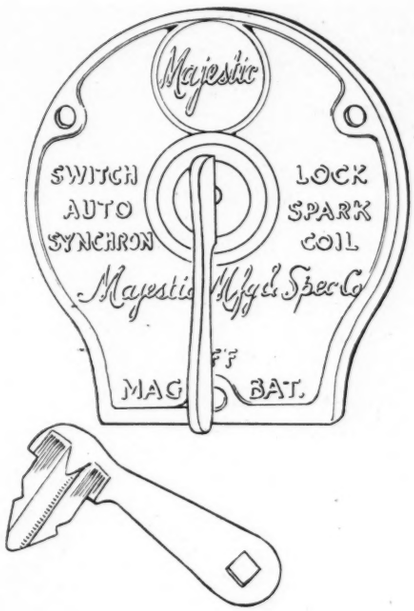
THE utility heater takes the place of the foot rest in the rear seat of a car. It may be left in the year around and is so small as not to be conspicuous. Heat is small as not to be conspicuous. Heat is drawn from a stove fitting over the exhaust valve. There are no gases from the heater to annoy the passengers or noise of exhaust gases passing through the heater. The degree of temperature of the heater may be controlled by a regulating valve built into one end, within easy reach of the rear-seat passengers. This valve may be entirely closed for warm-weather driving. There are two sizes, a standard model applicable to all makes of cars selling for $15 and the utility Jr. for Fords selling for $7.50. Hill Pump Valve Co., Archer Avenue and Canal Street, Chicago.

Atomizing Primer for Starting

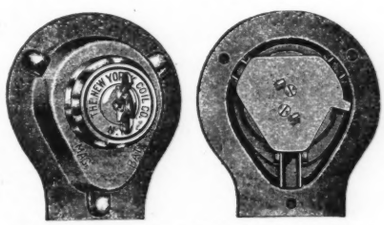
When the motor is cranked with the throttle closed the suction from the intake manifold causes air to rush through the small tube of the primer, passing over the gasoline orifice and thus allowing a properly vaporized fuel to pass into the cylinders. The atomizing primer is a product of the Longest Bros. Co., Louisville, Ky., and is made in two models. Model No. 1, listed at $2.50 is filled by hand and is installed by drilling through the manifold. In this model, the motor is started by removing the cap of the primer and filling it about three-quarters full of gasoline. Model No. 2 sells for $5, and may be used with cars having the pressure or vacuum-feed system. It may also be connected to a small dash tank, or may be used in the gravity system if the tank is higher than the primer. The latter model may be operated from the driver's seat.

Superfecter Auxiliary Air Valve

Additional air is admitted into the intake manifold, by means of this valve. It is composed of a cylinder with a ¼-inch pipe connection to the intake manifold, and housing a plunger; the plunger being held in the open position by an adjustable spring, and in the open position by the suction in the manifold. This spring is adjusted so that the plunger is in the closed position when the throttle is closed, and opens as the motor's speed increases. As the plunger opens it uncovers a series of holes, admitting additional air, and the amount of opening may be controlled from the dash. Buffalo Motor Appliance Co., Buffalo, N. Y. Price, $7.



Ignition lock for Fords. The screw holes are closed when the switch is locked



New York ignition lock for use on Ford cars

Carbon Decomposer

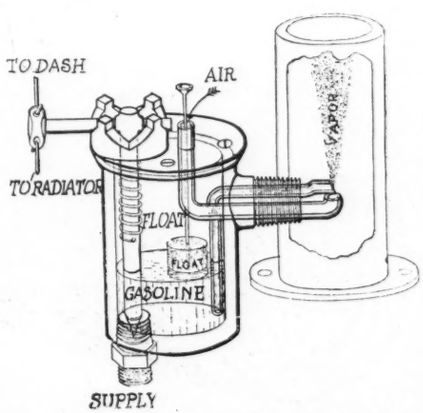
The VandeWater carbon decomposer mixes steam with the explosive charge within the motor and is automatically controlled by the vacuum produced from the pistons. To install, it is necessary to tap the inlet manifold with a ⅛-inch pipe tap, screw in the decomposer, always keeping the valve vertical, as the check valve will not work on an angle; tap the cylinders or the water outlet manifold and screw in the tube that connects with the top of the strainer. The device is used with the motor running about 1,000 r. p. m. Price, $5. VandeWater Engineering Co., Elizabeth, N. J.

New York Lock for Fords

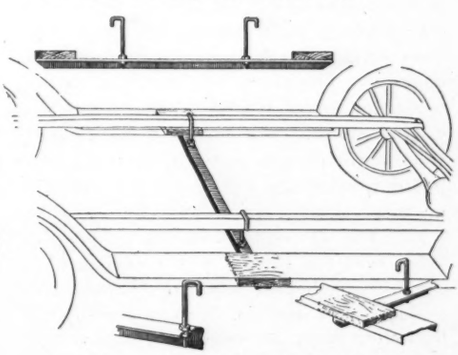
A compact lock of novel design for Ford cars is the latest offering of the New York Coil Co., 338 Pearl street, New York. It is so constructed that installation is very readily effected by the simple removal of the three screws which hold the nameplate of the regular Ford switch, and substituting in its place the ignition lock. There are three sliding members which are forced outward by a three-lobed cam inside the switch. These sliding members cover the screw holes when the car is locked. The key can only be removed when the switch is in the off position. The price is $3.

Body Brace for Ford Cars

This is a strong steel angle brace that braces the body, running boards and fenders of a Ford car. It is claimed that it also supports the body of the car in such a way that it relieves the springs and makes toward easier riding. No alterations are necessary to apply it and it is stated that it can be put on by the owner in 15 minutes' time. The price, complete ready for installation is $2.50. Dow Wire and Iron Works, Louisville, Ky.



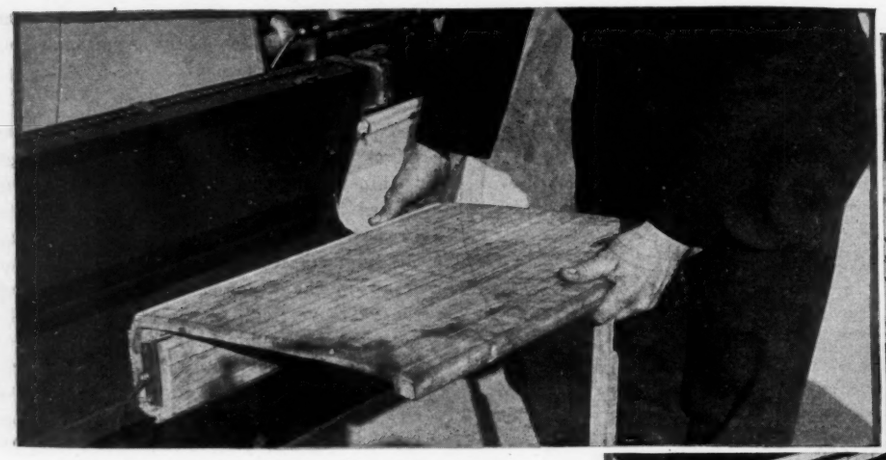
Atomizing primer to assist starting in cold weather



Body brace to stiffen Ford cars. It is attachable without alterations being necessary

Made-to-Order Camping Car

Los Angeles Man Fails to Find Suitable Car and Builds His Own



The Sharkey camp car has a table that rolls. At the right is shown the gas stove and its method of attachment, which is Sharkey's own

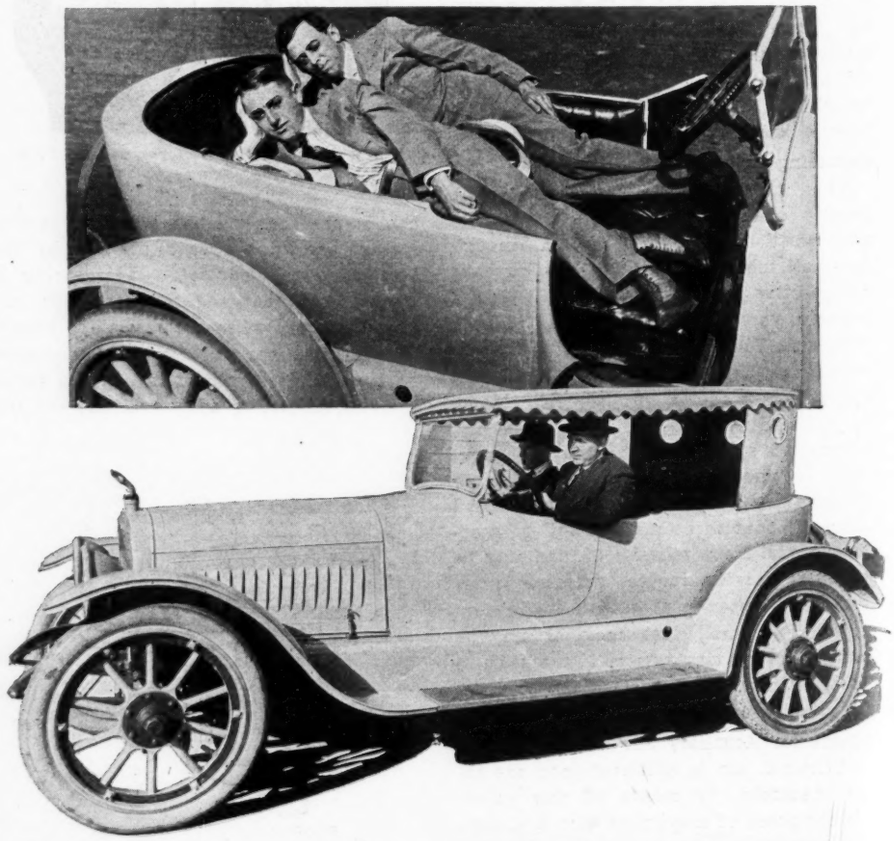
THE motoring trip is a mother of inventions, and one of the latest of these inventions is a specially designed body that makes camping a blessing and a joy forever for two persons. A. G. Sharkey of Los Angeles wanted a car with comfortable and compact accommodations for a camping tour. He could not find just what he wanted, so he made his own design.

The chassis is a 1915 Chandler six. The body is said to be idealistically boat-shaped, but not so streamline as to be too narrow for comfortable sleeping quarters for two. Before this the back of the front seat has been cut and used as a ledge on which to rest the rear seat cushions, but Sharkey tried a new plan. Both front and rear seats are movable in the same way as a bed davenport, and when they are laid down the bed is ready.

The body is arranged so that it can be enclosed entirely for protection against rain and when the occupants of the car are asleep. The top is wired, and at night the interior is light.

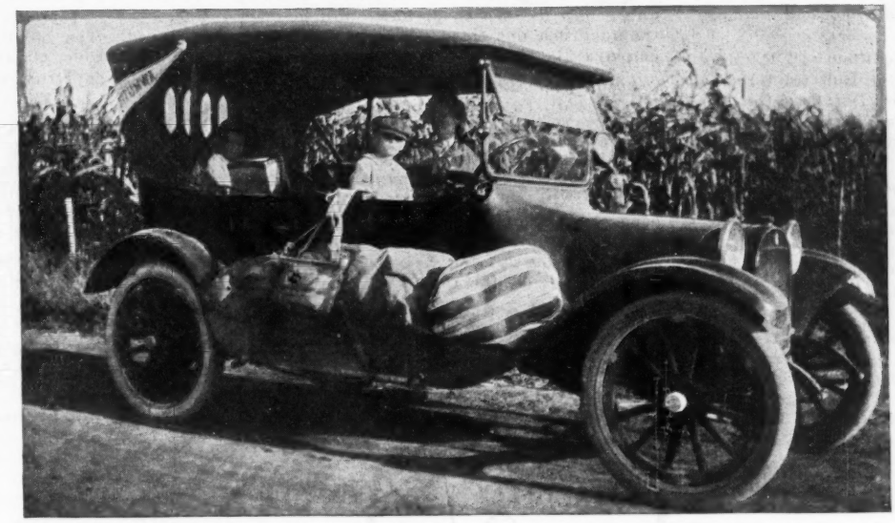
A gasoline stove is part of the motor. The fuel is taken direct from the main feed line, and all piping is protected by asbestos. The stove has two burners and when not in use is folded against the side of the motor. The owner plans to keep food warm on the stove after the fire is put out, using the heat from the motor to do this. A kind of fireless cooker result.

For the dining-room there is a rolled table that fits snugly into a cupboard on the running board. The table is rolled as the top of a desk is. Two sticks support the outer edge. A round box, safely fastened to the back of the car, contains compartments for utensils and supplies. In short, the car has a place for everything.



Above is the way the Sharkey camp car accommodates its passengers for the night, while below is a view showing it ready for the road

Routes and Touring Information



This shows the tent in traveling trim on the running board, where it was out of the way. The poles were cut with slip joints, so they could be carried here also

Iowa Motorist Writes of Tent Outfit Which Has Proved Satisfactory in Its Tests

W. K. BRECKENRIDGE and family, Ottumwa, Ia., offer a tent outfit as their contribution to the comforts of motorists. They recently made a trip of 1,600 miles, on which they found it very satisfactory.

The tent has a floor 8 feet square which is sewed in. An extension of about 2 feet on the front edge of the floor can be fastened over the running board of the car. The front wall of the tent is 7 feet high and extends over the top of the car when the tent is pitched in this way, or it may be used as a straightfront for the closed tent when the car is not attached.

Two 7-foot poles prevent undue strain on the car top. The poles were cut with slip joints to be of proper 4-foot length to carry on the running board. The side walls have extensions of about 10 inches on the front edges to fasten to convenient places about the car, making a tightly closed tent in case of storm or cold wind. One side wall has a window, and the other has a door.

The rear wall is about 3½ feet high and was kept at a convenient heighth by its location near a fence, tree or other object to which ropes could be attached.

The tent was made of khaki at a cost of $18. The Breckenridges carried three folding camp cots. They advise, however, the use of heavy blankets on the tent floor during cool weather in preference to cots. The tent was adapted to an Overland by a 6-inch flap sewed to the front wall to make sure of protection for the car. The size given is suitable for a car having a 7½- or 8-foot top.

Washington, D. C.—Jacksonville, Fla.

Greenfield, Mass.—Editor Motor Age—Kindly give the best route from Washington, D. C., to Jacksonville, Fla.—F. A. Rugg.

In going from Washington, D. C., to Jacksonville, Fla., we advise that you go via Alexandria, Va., Fredericksburg, Ashland, Richmond, Blackstone, South Hill, Soudan, Va., Bullock, N. C., Oxford, Providence, Durham, Hillsboro, Burlington, Greensboro, Candor, West End, Pinehurst, Jackson Springs, Rockingham, Cheraw, S. C., Patrick, Bethune, Camden, Blaney, Pontiac, Columbia, Lexington, Batesburg, Langley, S. C., Augusta, Ga., Waynesboro, Ardmore, Savannah, Darien, Broadfield, Brunswick, White Oak, Woodbine, Kingsland, Ga., Yulee, Fla., to Jacksonville, Fla.

Volume 6 of the Automobile Blue Book will give you complete running directions for this trip.

Chicago, Ill.—Jacksonville, Fla.

Louisville, Ky.—Editor Motor Age—In the October 19 issue of Motor Age, under the caption, "Routes and Touring Information," I note that in routing motorists from Chicago to Jacksonville, Fla., you give, Nashville, Murfreesboro, Manchester, Tracy City and Chattanooga. While the writer has not been over this road in person, it is our information that the Dixie highway through the mountains, from Nashville to Chattanooga, is almost impassable for a distance of about 14 miles, consequently we have been advising the Huntsville, Ala., route between Nashville and Chattanooga.

My information has not only come from motorists who have come over this road recently, but from members of the Nashville Automobile Club and, if I am not mistaken, the Dixie Highway Association, whose offices are located in Chattanooga, has been routing motorists via Huntsville between these two points.

You are also in error in giving the routing from Louisville to Nashville. The routing, which you intended to give, no doubt, is the Dixie highway, which, at this time, is the bettter route of the two. However, the route you gave reads: "Cave City, Glasgow, Springfield to Nashville," and should be: "Cave City, Bowling Green, Russellville, Springfield, Tenn., to Nashville," which is the route of the Dixie highway and also the route which we recommend. Glasgow, Ky., is on the Jackson highway. In giving routing between Louisville and Nashville, you would not make any error in the following: "Louisville, West Point, Elizabethtown, Horse Cave, Bearwallow, Glasgow, Scottsville, Gallatin, Nashville."

For your information, also, I would like to state that you need not hesitate routing tourists through Louisville to Nashville at any season of the year, as they will find improved hard-surfaced road all the way.—Eugene Stuart, Secretary, Louisville Automobile Club.

This shows the arrangement of the tent in relation to the motor car. The tent can be used also without being attached to the car

Among the Makers and Dealers

THE Economy Motor Co.—The Economy Motor Co., Columbus, Ohio, has increased its capital to $150,000.

Tractor Man Extends Field—P. C. Meredith, state distributor for Bull tractors, has taken the agency for the Dort and the Hercules in the eastern sixty-six counties of Iowa. The new firm is called the Meredith Motor Car Co.

Llewellyn to Tire Co.—R. W. Llewellyn has been appointed manager of the branch of the Kelly-Springfield Tire Co. which recently opened in Columbus, Ohio. Mr. Llewellyn has been connected with the Harris-Llewellyn Rubber Co. for the last 5 years.

New Era Increases Factory—The New Era Spring and Specialty Co. has increased its productive facilities at Grand Rapids by the purchase of the Ruskin Biscuit plant, which is to be remodeled immediately. The company will maintain its main sales rooms at Detroit.

Page Buggy Co. Adds to Force—The Page Bros. Buggy Co., Marshall, Mich., manufacturer of motor car tops, has recently doubled the working force of the organization and is in search of more men. The company supplies the Briscoe Motor Co. and others with tops.

Canada Chevrolet Extending—Extensions are being made to the present plant of the Chevrolet Motor Co. of Canada at Oshawa, Ont. The company has been manufacturing cars for a year and sold 8,000 last year. Three new buildings are being built to give an added floor space of 277,075 sq. ft.

Geisel Returns to Federal—Adolph A. Geisel, formerly associated with the Federal Motor Truck Co. and later with the Martin Fifth Wheel Co., has been appointed Federal sales manager for New England. L. C. Long, at one time the New England sales manager, is now vice-president and city sales manager for the Chicago branch.

Dudley to Federal Truck Co.—L. B. Dudley has been appointed advertising manager of the Federal Motor Truck Co., Detroit, to succeed G. W. Cushing, who resigned to take a position in the advertising department of the Hudson Motor Car Co. Mr. Dudley has had 12 years' experience in advertising and for 3 years has been with the Campbell-Ewald Co., where he had supervision of the agency accounts of the Federal company.

General Motors Builds—The General Motors Co. is erecting a one-story factory 734 by 200 ft. at Detroit. The building will be used for the manufacture of motors for use of affiliated companies of the General Motors, the output of the Northway Motor and Mfg. Co. having proved insufficient. The site was originally planned for use for the Cadillac company's new plant, but different arrangements followed the purchase of another site last week by Cadillac.

Tool Company Changes—Control of the Giddings & Lewis Mfg. Co., manufacturer of machine tools, slotters, multiple spindle and turret lathes, has passed from C. E. Cleveland and Henry Rueping to the Fred Rueping estate, until now a minority stockholder. Messrs. Cleveland and Rueping retire as president and secretary-treasurer, respectively. M. Cory, who has been associated with the Concrete Steel Co., Chicago, has been appointed general manager. The new owners will start work immediately on a large shop addition, a new office building and a new pattern shop, which will increase the facilities one-third. The company now employs 346 skilled machinists.

Auto Top Co. Increases Capital—The Decker Auto Top Co. has increased its capital from $15,000 to $50,000.

Death Changes Firm Name—The name of the Ashton-Wright Company, distributor for the Inter-State in Southern California, has been changed to Wright Motor Car Co. Mr. Ashton, a member of the old firm, was killed recently while driving to San Diego, when his car went off the road.

Cutler-Hammer Building—The Cutler-Hammer Mfg. Co., Milwaukee, Wis., manufacturers of the C-H magnetic gearshift and other electrical controlling devices, switches, etc., will start work at once on the erection of a new administration building, laboratory and

Coming Motor Events

RACES

—1916—

*December 25—Speedway, Los Angeles, Cal.

—1917—

May 19—Metropolitan Trophy, New York speedway.
†May 30—Indianapolis speedway.
†June 9—Chicago speedway.
June 23—Cincinnati speedway
†July 4—Omaha speedway.
†July 14—Des Moines speedway.
†July 28—Tacoma speedway.
August 4—Kansas City speedway.
†September 3—Cincinnati speedway.
†September 15—Providence speedway.
†September 29—New York speedway.
October 6—Kansas City speedway.
October 13—Chicago speedway.
October 27—New York speedway.

* Sanctioned by A. A. A.
† A. A. A. championship events for 1917.

MEETINGS

January 9-11—Mid-winter meeting, Society of Automobile Engineers.

SHOWS

December 18-20—San Francisco show.
December 30-January 6—Cleveland, O., show.
January 2-10—Salon, Hotel Astor, New York.
January 5-11—Milwaukee, Wis., show.
January 6-13—New York show.
January 13-27—Montreal, Can., show.
January 13-20—Montreal show.
January 20-27—Detroit show.
January 22-27—Oklahoma City show.
January 22-27—Rochester, N. Y., show.
January 23-27—Baltimore show.
January 27-February 3—Chicago show.
January 29-February 3—Buffalo show.
February 3-10—Minneapolis show.
February 10-17—San Francisco show.
February 12-17—Kansas City show.
February 12-17—Louisville, Ky., show.
February 12-17—Louisville, Ky., show.
February 13-17—Sioux City, Ia., show.
February 14-17—Peoria, Ill., show.
February 18-25—St. Louis, Mo., show.
February 19—Pittsfield, Mass., show.
February 19-24—Bridgeport, Conn., show.
February 19-24—Des Moines, Ia., show.
February 19-24—Duluth, Minn., show.
February 26-March 3—Omaha, Neb., show.
March 3-10—Boston show.
March 6-10—Fort Dodge, Ia., show.
March 14-17—Davenport, Ia., show.
March 14-17—Mason City, Ia., show

general industrial building costing $150,000. Plans have been completed and contracts awarded. The building will be 283 ft. long and 50 ft. wide, six stories and basement, of fire-proof construction. It is to be ready about May 1, 1917.

White Wants Tax Reduction—County Auditor Zangerle, Cleveland, Ohio, has added $5,000,000 to the White Co.'s valuation, claiming this to be good will. The company asked for a reduction of $13,071,000, but the auditor has refused to make it.

Briscoe Mfg. Co. Damaged by Fire—The Briscoe Mfg. Co., a subsidiary of the Maxwell Motor Co., was damaged by fire Nov. 21 to an extent gauged at $60,000. The Briscoe company manufactures the fenders, tanks, radiators, hoods and stamped parts for Maxwell cars.

John H. Fitch Dies—John H. Fitch, inventor of the Four Drive tractor and president of the Four Drive Tractor Co., Inc., Big Rapids, Mich., died November 24, after a brief illness. His office is filled automatically by Elbert J. Jenkins, who will continue also as general manager.

Grant Motor to Move—The Grant Motor Corp., Findlay, Ohio, will move to its new plant in Cleveland within the next 2 weeks. The company still has 300 cars to finish at Findlay and will start production before Dec. 1 in Cleveland with a schedule of 1,000 cars in December.

Moyer Resigns From Champion—Arthur W. Moyer has resigned his position with the Champion Ignition Co., where he handled the factory business. Mr. Moyer was formerly with A. R. Mosler & Co. He will return to his original business, the Moyer-Shaw Mfg. Co., manufacturer of toys, in which he has always retained his interest.

Haynes Plans Increased Production—The Haynes Automobile Co., Kokomo, Ind., has made plans for the purchase of machinery to produce 100 cars daily. A new building will be erected with a capacity for three times as many cars as are made at present. It will have 600,000 sq. ft. of floor space. The company has 350,000 sq. ft. at present.

Accessory Company Expands—Not only has the Marvel Accessories Mfg. Co., Cleveland, Ohio, increased its capital to $100,000, but it is building a new plant, which will give more than 45,000 sq. ft. of working space. The company produces accessories that are sold through jobbers. Among its products are vulcanizers, an adjustable socket wrench, valve grinders and combined tire chain fastener and tire tool.

Westcott Co. Production Delayed—Like several other manufacturers, the Westcott Motor Car Co., Springfield, Ohio, has been delayed by the inability to get material. This, together with the removal of the factory to Springfield from Richmond, Ind., for a while seriously handicapped production, but the company now announces that material is coming in regularly and manufacturing conditions are becoming normal.

Specialty Company Expands—Though the J. P. Gordon Co., Columbus, Ohio, has made two large additions to its plant during the last 12 months and now has floor space of more than 100,000 sq. ft., it has been compelled to put on a night shift of 200 operators and will add to this as rapidly as new operators can be secured and trained.

The company makes seat covers, tire covers and radiator and engine robes, as well as top for Fords.

Westinghouse Makes Starter Contract—The Westinghouse Electric Co., Detroit, has closed a contract for $250,000 worth of electrical supplies with the A. B. C. Starter Co.

Walden with C. T. Silver—A. E. Walden has been appointed manager of service for C. T. Silver of New York. Mr. Walden was formerly in the experimental department of the Chalmers Motor Corp.

Doak Goes to Ohio Electric—R. R. Doak has been made assistant sales manager for the Ohio Electric Vehicle Co. Mr. Doak was formerly branch manager for the Woods Electric Co. in St. Louis.

Smith Blair Truck Sales Manager.—G. E. Smith has been made sales manager of the Blair Motor Truck Co., Newark, Ohio. F. L. Swanberg has resigned as manager and J. P. McCune and F. O. Spaulding will take his place.

Bellefontaine Co. Elects—The incorporators of the Bellefontaine Automobile Co., Bellefontaine, Ohio, incorporated some time ago to manufacture a new pleasure motor car, met recently and elected A. J. Miller, president; J. H. Wells, vice-president, and E. P. Humphreys, secretary-treasurer. A prize will be given to the person suggesting the best name for the car to be manufactured by the company.

New Tire Ready Soon—George W. Odell, secretary of the International India Rubber Co., South Bend, Ind., has just returned from Philadelphia, where he purchased machinery and equipment for the new plant. The concern will begin the manufacture of motor car tires early next year. The first unit of the plant is nearly complete and the tread patterns for the tires to be manufactured by the company have been patented.

Republic Agency Expands—The Chicago Republic Truck Co. will open a new salesroom and service station for Republic trucks Dec. 1. It will distribute in Illinois, Wisconsin, northern Indiana and upper Michigan. W. C. Vliet, formerly branch manager of the Studebaker Co., Washington, D. C., Fargo, N. D., and later wholesale manager of L. Markle & Co., Chicago Studebaker distributors, is president. W. E. Kenyon, formerly sales manager Sandow Motor Truck Co., Chicago, has accepted a position as sales manager.

MacLaughlin to Lewis Corp.—Henry MacLaughlin has joined the Lewis Motor Corp. as factory manager of the Detroit plant, Mr. MacLaughlin was formerly superintendent of Golden, Belknap & Swartz.

Moon Team Wins Cup—The trophy cup offered by the Motor Accessory Trade Association in the Automobile Baseball League has been formally presented to the Moon factory team, which won 16 out of 21 games.

New Truck Company Plans Start—The Lumb Motor Truck Co., Aurora, Ill., expects to get into a permanent location Dec. 1. The company has been organized with a capitalization of $200,000 to manufacture trucks of ¾-, 1½- and 2-ton capacity.

Gear Maker Expands—The C. A. S. Products Co., manufacturer of motor car gears, recently has completed alterations at its plant which have more than doubled the capacity. The company is employing 130 men. Recently a $75,000 order for gears was obtained from a single concern.

Plant to Pay Men More—L. P. Halladay Automobile Co., Streator, Ill., has increased wages and will operate its plant on an 8-hour basis with 10-hour pay. In addition, there will be a bonus for the senior employes and those who work regularly. Those in the service a year or more will be paid a bonus of 5 per cent.

Fails in Suit to Collect—The new Columbus Buggy Co., which took over the plant of the old Columbus Buggy Co., lost a suit involving $4,000, which it tried to collect from the creditors of the old Columbus Buggy Co. The court of appeals held against the new company, and the supreme court failed to grant an appeal.

Whitman to National Vehicle—F. H. Whitman, Detroit, has been appointed production engineer of the National Motor Vehicle Corp. He will have charge of the production of the 6,000 cars which the company is scheduled to produce next year. Within a week the new three-story addition to the plant will be in operation and at that time Mr. Whitman is to install a system of construction which will give the plant a capacity of forty cars a day.

Alter Builds New Plant—The Alter Motor Car Co. is erecting a plant comprised of four buildings at Grand Haven, Mich. The plant will be ready by Dec. 15.

Gloetzner with Covert Gear—A. A. Gloetzner has been appointed chief engineer and manager of sales for the Covert Gear Co. Mr. Gloetzner was formerly chief engineer for the Bour-Davis Co.

New Truck Announced—The Gerlinger Motor Car Co., Tacoma, Wash., announces it is building a 1½-ton, six-cylinder, self-starting and electric-lighted truck that will be ready for delivery Feb. 1.

Fire Destroys Kresser Plant—Fire completely destroyed the Kresser motor car plant at Fostoria, Ohio, with a loss of $40,000. The company has been making bodies for the Allen Motor Car Co. of that place. The state fire marshal will investigate the fire.

Dingley to Sell Cars—Bert Dingley, the former race driver, who was almost killed in an accident on the Tacoma speedway, is now traveling representative for the Mitchell Motors Co., with headquarters in Los Angeles. Dingley can drive a car with all his old expertness, but when walking has to use a crutch or cane.

Boylan to Sewell Co.—Fred E. Boylan has resigned as manager of the Detroit branch of the Swinehart Tire and Rubber Co. to become factory representative of the Sewell Cushion Wheel Co. Mr. Boylan will visit branches in Cleveland, Buffalo, Rochester, Boston, New York, Philadelphia, Baltimore, Pittsburgh, Cincinnati, St. Louis, Chicago and Minneapolis.

Truck Defense Is Urged—W. E. Conway, Jr., manager of the Garford Motor Truck Co., Inc., St. Louis, is promoting an organization for truck sellers and truck owners to handle such questions as the prohibition of trucks from boulevards. "Just at persent," says Mr. Conway, "some power is needed to defend our interests against the movement to bar trucks from certain of the streets. Such questions often arise and they will increase."

Recent Incorporations

Akron, Ohio—Akron Universal Motor Co.; Capital stock, $10,000; incorporators, R. G. Glass, John A. McAlonan, G. W. Kans, W. E. McCue and G. B. Metz.

Cambridge City, Ind.—H. & M. Auto Parts Co.; Capital stock, $10,000; motor car parts; incorporators, O. E. Huddleston, Alpheus Huddleston and C. J. Marson.

Chicago—Commercial Vehicle Motor Co.; Capital stock, $100,000; incorporators, Emil C. Wettern, Clarence N. Boord and Jasper Fromme.

Cleveland, Ohio—Auto Fender and Radiator Co.; Capital stock, $10,000; to manufacture and sell accessories; incorporators, William J. Shaver, C. E. Shank, L. E. Hentzell, Elma L. Waller and M. E. Shank.

Cleveland, Ohio—Cleveland Automobile Body Co.; Capital stock, $10,000; to manufacture motor car bodies; incorporators, R. B. Newcomb, Munson Havens, Wm. E. Tousley, F. A. Pope and Frank M. Cobb.

Cleveland, Ohio—Smith Farm & Truck Sales Co.; Capital stock, $50,000; incorporator, Fred S. Wallace.

Clyde, Ohio—Clyde Auto Distributing Co.; Capital stock, $25,000; to sell motor cars; incorporators, W. D. Hughes, W. A. Roush, L. C. Roush, John E. Morck and J. W. Flickinger.

Coshocton, Ohio—Ben-Hur Tire and Rubber Co.; Capital stock, $10,000; incorporators, W. P. Horton, Jr.; J. S. Culp, Thomas Brennen, Herbert P. Laurence and M. B. Glore.

Coshocton, Ohio—Midland Tire and Rubber Co.; Capital stock, $10,000; incorporators, W. P. Horton, Jr., J. S. Culp, Thomas Brennen, Herbert P. Laurence and M. B. Glore.

Danville, Ill.—Danville, Ill., Motor Car Co.; Capital stock, $10,000; to deal in supplies for motor vehicles; incorporators, Judith L. Johnson, Florence E. Hanna and Homer H. Cooper.

Dayton, Ohio—St. Clair Auto Livery Co.; Capital stock, $10,000; incorporators, George L. Baker, Edward E. Burkhart, Frank R. Baker, Joseph G. Michel and W. H. Baker.

Dayton, Ohio—Auto Safety Light Co.; Capital stock, $10,000; incorporators, George F. Deady, Carrie M. Deady and George F. Holland.

Evansville, Ind.—International Rubber Sales Co.; Capital stock, $10,000; incorporators, Marc Wile, L. B. Wile and Alex D. Rodgers, Jr.; to sell motor car tires and accessories at wholesale and retail and to do repair work.

Fort Worth, Texas—Panther Auto Cash Station; Capital stock, $5,000; incorporators, W. M. Harrison, W. P. Hardwick and Herman Gartner.

Hartford, Conn.—Eastern Motors, Inc.; Capital stock, $1,000,000; incorporators, W. D. Upson, F. A. Law and John R. Turk; to manufacture motor cars.

Houston, Tex.—Houston Buick Sales Co.; Capital stock, $10,000; incorporators, Frank Bradley, J. C. Thomas and B. D. Kent.

Indianapolis—Irvine-Fessler Motor Corp.; Capital stock, $25,000; incorporators, Dennis J. Bush, Robert V. Fessler and John Irvine; to manufacture motors.

Indianapolis—Guarantee Tire and Rubber Co.; Capital stock, $70,000; incorporators, George F. Kreitlein, C. W. Minesinger and Walter W. Kuhn; to deal in tires.

Indianapolis—Hassler Motor Co.; Capital stock, $200,000; incorporators, Robert H. Hassler, E. D. Fouts and David G. Onng.

Indianapolis—Meixell Co.; Capital stock, $10,000; incorporators, B. F. Meixell, Thomas E. Madden and Thomas J. Gannon; to manufacture motor cars and parts.

Jefferson City, Mo.—Harry Newman, Inc.; Capital stock, $10,000; to deal in motor cars, parts and accessories; incorporators, Harry Newman, Samuel V. Newman and Charles F. Levy.

Kokomo, Ind.—Periscope Spark Plug Co.; Capital stock, $150,000; incorporators, A. E. Long, J. M. Long and L. Long; to manufacture spark plugs.

Leechburg, Pa.—Kiski Auto Supply Co.; Capital stock, $25,000; incorporators, Aaron Ginzler, H. T. Cook, U. O. Heilman, C. F. Armstrong, D. S. McCallum, J. W. Crosby, T. E. Jones, H. E. Brace, J. Lees, O. C. Neely and Fred Hill.

Milwaukee, Wis.—Universal Tool and Apparatus Co.; Capital stock, $15,000; incorporators, Oscar Werwath and William Baum.

Milwaukee, Wis.—Acme Chemical Co.; Capital stock, $10,000; to manufacture and market chemicals, oils, greases, soaps, etc.; incorporators, Vincent J., Mary E. and Edward V. Halaska.

Olympia, Wash.—Savage Tire Corp.; Capital stock, $10,000; incorporators, Claus Spreckels, H. N. Mayberry and Horton L. Titus.

Peoria, Ill.—Peoria Auto-Kot Co.; Capital stock, $3,000; to manufacture auto-kots; incorporators, Gerald H. Page, John W. Winzeler and George T. Page.

Phoenix, Ariz.—Brown-Dryer Motor Co.; Capital stock, $50,000; to manufacture and buy and sell motor cars and accessories; incorporators, Bert O. Brown and Roland C. Dryer.

Phoenix, Ariz.—Century Motors Corp.; Capital stock, $250,000; to manufacture, buy, sell and deal in motor cars and trucks; incorporators, Ben C. Lindsay and George H. Black.

Phoenix, Ariz.—Automobile Boats Mfg. Co.; Capital stock, $1,000,000; to manufacture motor cars and to perfect inventions of motor boats; incorporators, F. S. Hess and H. M. Harrison.

Pittsburgh, Pa.—Warrington Auto Car Co.; Capital stock, $10,000; incorporators, H. F. Thomas, Ralph H. Frank, Pittsburgh, Bruce Harrison, E. W. Allison and R. C. Mason.

Portland, Ind.—Sheller Wood Rim Mfg. Co.; Capital stock, $25,000; incorporators, H. E. Sheller, E. J. Minch, A. F. Blowers, E. M. Haynes and Carl Bimel; to manufacture single piece wooden motor car steering wheel rims.

Toledo, Ohio—Beacon-Lite Auto-Signal Co.; Capital stock, $7,000; incorporators, Paul R. Harsh, Edward Yeager, Mary Yeager, Clara S. Harsh and Ulysses F. Baker.

Washington, D. C.—Hurley Motor Co.; Capital stock, $12,000; incorporators, A. J. Taylor, L. S. Hurley and Addie H. Hurley; to do a general motor car business.

From the Four Winds

CHICKEN IS JOY RIDER—S. Drumhoff, Los Angeles, chauffeur, has trained one of his employer's chickens to appreciate the pleasures of motor car riding, and Peggy Paige, with a squawk of pleasure, runs and jumps up on the bumper every time the car is taken out. She rides undisturbed by downtown traffic or whirls over the boulevards at 30 miles an hour. She has even made the round trip to San Diego and back, 132 miles each way.

WHERE Old Cars Go—Joseph J. Bins, Green Bay, Wis., says he has driven his old KisselKar 216,024 miles without grinding the valves, and the motor is running as well as ever.

New Vacation Idea—Vacations differ. One Kansas City dealer's idea is more work, only different. With this idea he has called in one of his Kansas territory men, and he himself has gone out to sell cars. He will travel in a Hupmobile and demonstrate until the weather gets too bad for travel.

Speedway Buys $50,000 Site—The Pittsburgh Speedway Association has bought 447 acres on the Youghiogheny river for a club house and speedway oval. The price was $50,000. The site is located centrally for about 2,000,000 persons in four counties, and railroads offer 35-minute transportation.

Hard Trip for Overland—The first passage of any vehicle on wheels between the cities of Tangiers on the Atlantic coast and the inland Fez in Morocco was made by an Overland last summer. The total distance was 500 miles, and it took 5 days to make the trip, which was over rough roads most of the way.

Car Earns $25 Daily—The income derived from one Studebaker bus between Los Angeles and San Francisco averages $25 a day. To make this income the bus, which is fourteen-passenger, has covered 65,000 miles in 10 months. This is said to be a record for a commercial car over a 10 months' period.

Winter Speed Censor Prepared—Warren Sexton, the speed censor of Belleville, Ill., apparently does not intend to lose his grip on speeders when cold weather comes. This summer he has been using a motorcycle, but he fears this will be dangerous with snow on the ground, so he has prepared a motor sled which he says will make 40 miles an hour. The body is 9½ ft. long, 3 ft. wide and 2 ft. high. The tonneau of a motor car supplied the seat. A motorcycle engine furnished the power for the rear wheel of a motorcycle, which will be covered with chains instead of a tire to supply the grip to force the sled ahead.

Railway Sues Motorist—One of the first damage actions ever brought by a public service corporation against a motorist is that of the Milwaukee Electric Railway & Light Co. against Mrs. A. A. Luther, of Milwaukee, Wis. The complainant says one pole was seriously damaged and another bent and broken when the defendant "negligently drove her motor car" into the company's property. Damages of $85.06 are asked.

Pennsylvania Registration Premature—The motor car division of the Pennsylvania state highway department had received $66,400 for 1917 licenses up to the close of business November 15. Receipts are now coming in at the rate of $4,000 a day, and despite the time of year about $800 is being received each day for 1916 licenses.

Provides Own Water Supply—So that the city may not be embarrassed by its large consumption of water during the dry seasons, the Goodyear Tire & Rubber Co., Akron, O., has bought a lake, 100 acres of land and a lease on land around another lake. The supply will be independent of that of the city. So far about $78,000 has been spent on land and water properties.

Marion O., Adopts Traffic Code—Marion is among the Ohio cities adopting new traffic codes to meet modern needs. The Marion County Automobile Association has been largely instrumental in securing the adoption of several valuable provisions. Among the principal features of the new ordinance are these provisions: Pedestrians crossing any street at an intersection shall remain within the bounds of the sidewalk extended and shall not cut diagonally and shall cross with the direction of the travel as indicated by the traffic officer. No vehicle shall stop within 25 ft. of the entrance to any theater or public building, except when taking on or discharging passengers.

Way Paved with Tombstones—A party of vandals in a motor car practiced a new and peculiar type of desecration along the road between Somers Point, N. J., and the May's Landing boulevard. Mired deeply, after having started on the wrong road, they saw a nearby cemetery and, tearing up a number of tombstones, made a track for their machine to get out of the mud. The stones were left in the mud.

Tire to Advertise Mutual Comedian—All motor cars of the Mutual Film Corp. are to be fitted with a specially constructed non-skid tire which will write the name of Charlie Chaplin, the highest priced comedian, in the dust of the road three times for each wheel revolution. Between prints of the name will be footprints, those of the champion foot-worker, these being also on the tread of the new tire, which is to hit the market as the "Charlie Chaplin Non-Skid Tire."

Warn Motorists of Trap—Before establishing speed traps on the boulevards of San Bernardino county, the authorities issued a warning to all motorists, telling them the traps would be set and it would be advisable to comply with the law. The enforcement is to be drastic, and severe penalties are to be inflicted for violations. Many miles of boulevard in San Bernardino county penetrate the vineyard regions, and crossroads are few and far between so 40 miles an hour has become the customary rate of travel.

Florida Establishes Motor Camp—New Port Richey, located on the Dixie highway, Old Spanish trail and Paradise loop, is the first town in Florida to establish a motor camp. It includes a comfort station and a community building where the motorists can gather at night for entertainment. Motorists are welcome for a day or a season. The board of trade and women's civic club are fostering the camp. More than 200 cars have been checked through already, and it is expected that 1,500 from the North will pass through before the new year.

Kentucky Makes Own License Tags—With the lists practically closed for the fiscal year, there are 31,700 motor cars registered in Kentucky this year, a gain of 12,200 machines over last year and one for each 75 persons in the state against a machine for each 121 persons last year. This year a machine was registered from each county in the state. The 1917 plates have been delivered and are made in this state, even the steel being rolled here. They show black numerals on white background. Predictions are that 50,000 licenses will be taken out next year.

Recognizes Work on Highway—Led by appreciation of the work the business men back of the Dixie highway are doing for the construction of a thoroughfare from Michigan to Florida, the East Palestine Rubber Co., East Palestine, O., and Pittsburgh, Pa., have given five Nabob tires and tubes for use on the official Overland car presented to the association by the Willys-Overland Co. The rubber company receives no direct benefit from the highway, as its factory and general offices are not located on it, but the company recognizes the value of the work and took this way to express its appreciation.